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Paper TRADE JOURNAL

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VOLUME 125, No. 3 JULY 17, 1947

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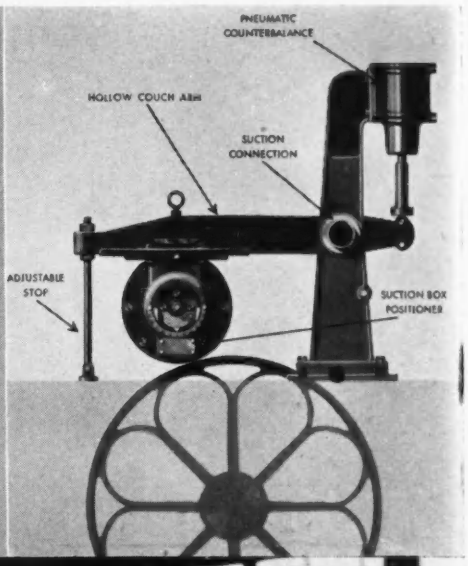

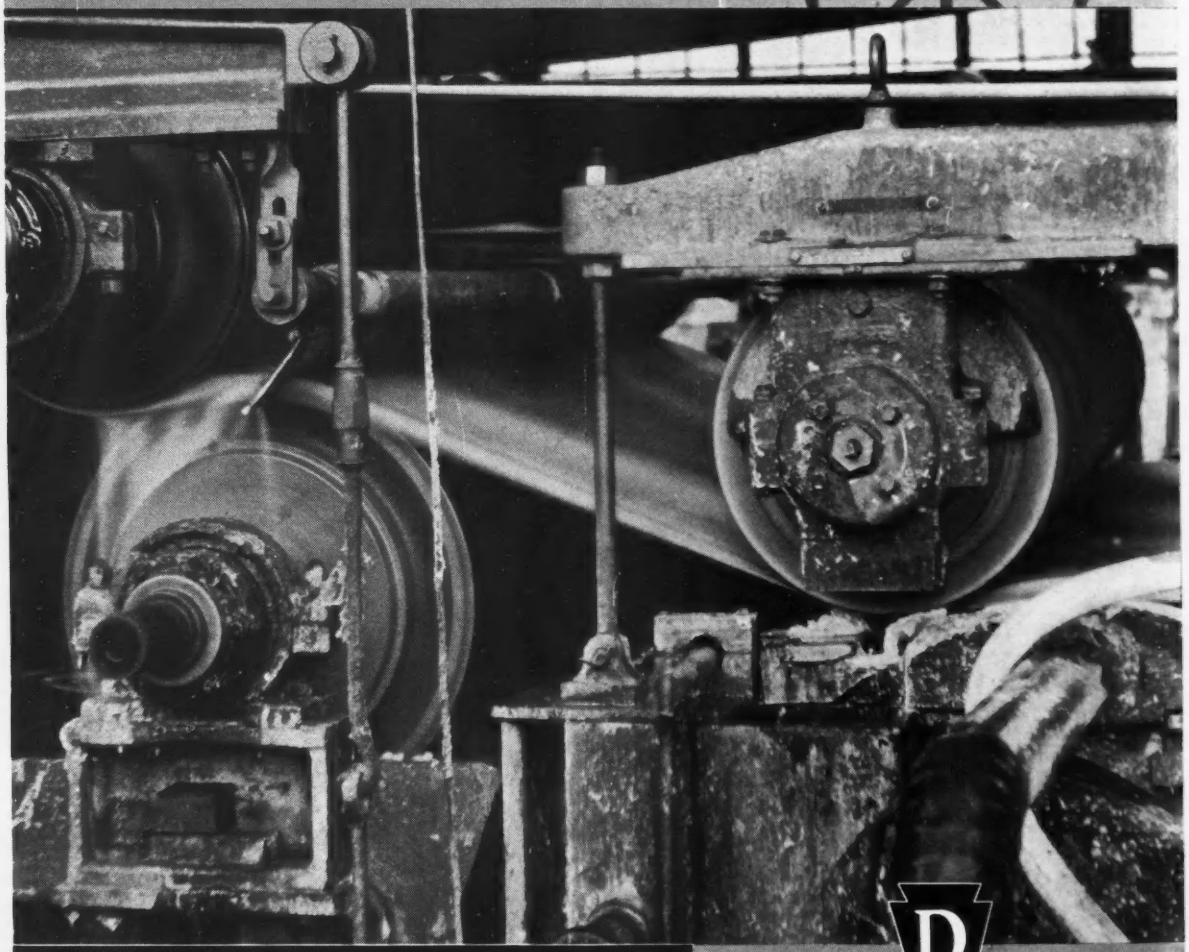

DOWNINGTOWN

Designers & Builders
Paper Making Machinery

IN THIS ISSUE

JULY 17, 1947

Canada Census Counts Paper Industry Value	9	MARKETS	30
Reciprocal Trade Conference Lags	9	PRICES	32
Jesse Swift Retires From Lily-Tulip Cup	10	United States Patents on Papermaking	36
Burpee Will Leave General Aniline	10	OBITUARY	40
B.F.D. Force Calls Off Strike Threat	12	PRODUCTION RATIO REPORT	44
Newsprint Shipments Exceed Production	12	EDITORAIL	45
FINANCE	14	CLASSIFIED ADVERTISING	64
Scott Peps Up Men With Visit To Mill	16		
House Votes Funds To Avert Floods	16		
Kaukauna Starts Work On New Power Plant	16		
Gurley Enlarges Its Reticle Department	20		
Hercules P.M.C. Shifts McClaire and Reeves	20		
New Developments In The Erection Of Transite Pipe	22		
IMPORTS	26		
TRENDS	28		

Technical Section ("TAPPI")

New Applications for Boiler Feedwater Treatment Equipment	47
Methods for Combining Phenolic Resins and Paper	50
Variations and Similarities of Paperboard Mill White Waters	53

INDEX TO ADVERTISERS ON PAGE 78

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CALENDAR OF COMING EVENTS

September 3-6, 1947—TAPPI Fundamental Research Meeting, Appleton, Wis.

September 24-27, 1947—TAPPI Acid Pulping Meeting, Minneapolis, Minn.

October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention, Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

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Paper TRADE JOURNAL
REG. U. S. PAT. OFF.
VOL. 125, NO. 3 JULY 17, 1947

Canada Census Counts Paper Industry Value

TORONTO—According to the Dominion Bureau of Statistics the pulp and paper industry in Canada in 1943 had $667,458,143 invested in plant and equipment and whatever it takes to make pulp and paper. From estimates based on the latest annual reports covering 52 of the 109 pulp and paper mills, however, it appears that more than $1 billion is now invested in the industry.

The 52 mills have an approximate capacity of 4,953,200 tons annually or 70 percent of the estimated annual capacity of 7 million tons for the entire industry. The latest annual reports of the 17 companies which own the 52 mills show the total book value of their assets at more than $867 million. Deducting total current liabilities of $63 million, it appears that the net figure of $804 million represents the investment in seven-tenths of the industry. On this basis, capital invested in the whole industry would be $1.1 billions.

This figure, however, is not strictly comparable to the DBS 1943 result, The Financial Post points out. The DBS does not include many substantial assets, such as timber limits, hydro-electric developments, etc.; neither does it include investments in wholly- or partly-owned subsidiaries or other enterprises. In 1943, DBS showed total investment in all industry at $8.7 billions and $6.9 billions for the 40 leading industries.

The list of companies used to work out the capital investment figures includes both small and large operators and thus provides a representative cross section of the industry.

Fairfield to Expand Its Board Capacity

BALTIMORE, Md. — The Fairfield Paper Company, second largest industry in Fairfield county, has inaugurated an expansion program that will increase its production half again. Preliminary work was started this week on the construction of a two-story brick building, 485 feet long, 50 feet wide for two-thirds of the length, and 90 feet wide in the remaining portion.

The new building is to be located alongside the company's present No. 2 plant here. When completed, it will house a new paper board machine similar to the two now in operation at the mill.

Eight months will be required to complete the building, and an additional several months will be taken up for the installation of the new machinery. Then the paper company, which has been operating at capacity for some time, will be able to increase production by half again as much, Custer estimated. The company also has a plant at Beaver Falls.

Rhinelander Plants Will Increase Capacity

RHINELANDER, Wis. — An expansion program, estimated to cost more than $200,000, has been started by the Daniels Manufacturing Company here. The firm specializes in printing glassine and waxproof papers such as candy bar wrappers. The Rhinelander Paper Company already has started a major construction program to take care of the increased demand for protective packaging papers.

Racquette River Starts Three New Buildings

POTSDAM, N. Y. — Excavation work is under way for construction of three new buildings at the Racquette River Paper Company here. A pulp storage building will contain 16,000 square feet of floor space, a coating and painting building will have 6,000 feet and an office building will measure 140 by 40 feet.

Champion Buys Land For Employe Playground

CLEAR LAKE, Texas—The Champion Paper and Fibre Company of Houston, Texas, has recently purchased the 105-acre Sunrise Ranch on Taylor Lake, near here. Plans of the firm are to make a playground of the ideal location for its officers and employes. The site was purchased from J. G. Whitney of the Eastern States Petroleum Company at an approximate cost of $55,000.

Klund Lays Civic Duties Aside

ERIE, Pa. — P. H. Klund, engineer for the Hammermill Paper Co., has resigned from the advisory board of the city's smoke abatement committee. Mr. Klund asked to be relieved of his duties on the board because of ill health.

Reciprocal Trade Conference Lags

NEW YORK—The best information obtainable from the Reciprocal Trade Agreement Conference at Geneva, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry, is that no appreciable progress has been made to date in reaching an outcome. Many foreign countries are unable to make concessions commensurate with those offered by this country.

Practically all of the other negotiating nations have raised their duty rates in one form or another since the United States offered tariff concessions. Brazil has increased various rates and a Customs union between Belgium-Luxemburg and Holland and their colonies has the effect of mutual rate increases. Canada, by means of its declared value policy, can at any time fix a value on imports which is the equivalent of raising duty rates, by increasing the value upon which duties are computed.

In the case of most of the participating countries any concession by this country may be of doubtful value in facilitating export trade, through the inclusion of provisions suspending the effective date of any foreign concessions until the economic conditions in those countries justify reductions.

The United States Tariff Commission has issued the rules under which it will operate to conform to the Executive Order requiring escape clauses to be included in all future Reciprocal Trade Agreements. The details indicate that any complaint of injury must be accompanied by exceedingly detailed information to allow the Commission to decide whether the operation of a specific agreement is injurious to American industry. Even if the Commission finds a complaint to be justified, the application of the escape clause is within the discretion of the President. The rules provide that a complainant, assuming him to be an individual producer, must furnish details of imports in quantity and value, production, sales and exports by both the individual mill and the entire industry, relation of income from the product in question to all products made by the complainant, comparability of imported and domestic product, geographic area in which foreign competition is most intensive, and other data such as profit and loss statements, wages and other costs, and changes in price structure.

Jesse Swift Retires From Lily-Tulip Cup

BOSTON—Jesse G. Swift relinquished his supervision over the New England Division of the Lily-Tulip Cup Corporation. Mr. Swift has supervised the distribution of the Lily products for many years. As a result of this change, the company is combining the six New England States with New York State (exclusive of New York City) to form the Northeastern Division. George Austin, now district manager of the company's New York State territory, is appointed division manager of this newly created Northeastern Division.

J. Gilbert Swift, Jr., previously the district manager for Eastern Massachusetts, is appointed assistant division manager of the Northeastern Division, with specific responsibility for New England. He will be in direct charge of the new Lily-Tulip office for New England, to be located after July 15 at 79 Milk Street, Boston. Telephone number is Liberty 5830.

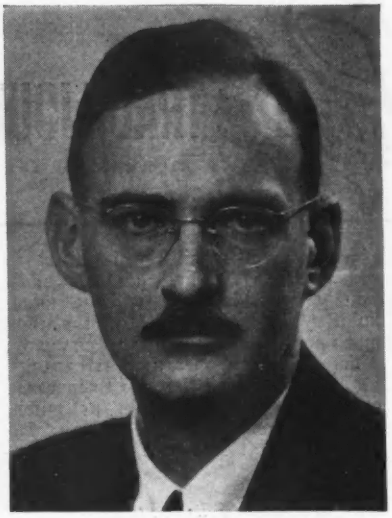
J. Frank Smith has been transferred from Pittsburgh to Boston and as district manager will be in charge of the Eastern Massachusetts territory, with headquarters in the Boston office. Mr. Smith has previously worked in the Boston area and is well known to many in the trade.

Other territory managers in New England are A. P. Simpson, L. M. Turner and M. E. Coyne. Sales representatives Maurice Spiller, Louis Howe, William Coumans and Gregory Joyce remain in their current capacities, although it is likely that this overall change and the enlarged division will require additional men and will provide increased responsibilities for present salesmen.

Once Jesse G. Swift made known his intentions, the following moves of the company were prompted by a basic desire to provide a broader divisional sales management, close to headquarters, with the company still providing the close field supervision required to properly handle the growth of markets of the company in the New England states and specifically to give more detailed attention to the development of the company's expanding sales force, to the company's work with wholesalers' salesmen, and generally to the company's business relations with customers.

Diamond Match Ups Sickman To be Plant Manager

SPRINGFIELD, Mass.—C. H. Sickman, veteran of 33 years with Diamond Match Co., 13 of them at the Springfield plant, has been named manager of the local establishment, according to an announcement from W. O. Augustine, vice-president and general production manager.



JOHN F. CUNNINGHAM, JR.
To manage Devine plant.

Cunningham to Manage For Devine at Mount Vernon

MOUNT VERNON, Ill. — The H. K. Porter Company, Inc., has appointed John F. Cunningham, Jr., as manager of the J. P. Devine Manufacturing Company plant.

Mr. Cunningham, formerly was research engineer and manufacturing division engineer for the Elliott Company, Jeannette, Pa., during the development of the first gas turbine power plant built in America. He has received degrees from Dartmouth College and Ohio State University in economics and mechanical engineering.

He is a member of the American Society of Mechanical Engineers, American Welding Society, Tau Beta Pi, and Sigma Xi.

National Gypum Promotes Hollingsworth to Buffalo

BUFFALO, N. Y.—Edmond B. Hollingsworth, manager of the National Gypsum Company's York, Pa., plant since September 1945, has been promoted to be assistant production manager of the company with headquarters in Buffalo. In his new position, he will assist in the administration of the company's production program in all plants. Mr. Hollingsworth, who has been with the company since 1936, has been succeeded as manager of the York plant by William W. Wallace of Chicago.

Templars Elect Teter

CHILLICOTHE, Ohio — Howard E. Teter, plant manager of the Mead Corporation, has been elected commander of Chillicothe Commandery, Knights Templar.

Burpee Will Leave General Aniline

BINGHAMTON, N. Y. — George W. Burpee, president of General Aniline & Film Corporation, will retire late this month to return to his post as a partner in a New York City management engineering firm. Mr. Burpee, who has directed the corporation since 1943, announced plans for resigning during a visit to the Triple Cities with Jack Frye, newly-elected chairman of the corporation's board of directors. It is expected Mr. Frye will be elected president of General Aniline to succeed Mr. Burpee at a meeting of the board July 21.

Mr. Frye arrived in Binghamton accompanied by E. Allan Williford, General Aniline vice-president in charge of Ansco. With Mr. Burpee, they toured Ansco's Binghamton properties, which make up the largest single unit of General Aniline.

The tour included the firm and paper plants, camera plant, research laboratories, warehouses and the new Ansco power plant, now being completed at Clinton and Jarvis Streets.

The new General Aniline board chairman later visited the Ozalid plant in Johnson City. There he was the guest of Joe W. Coffman, Ozalid's general manager, who also is a vice-president of the corporation.

Container Enlarges Staff At Midwest Office

CHICAGO—Container Corporation of America has appointed J. D. Brown and J. H. Mulligan to its midwest staff of field representatives specializing on sales to the ice cream, bakery, locker plant and paper jobber trade. Each will handle the company's entire line of paraffined cartons for ice cream, butter, lard, oleo and shortening, stock frozen food cartons for lockers and home freezers, and packages for bakery products.

Mr. Brown will cover a territory comprising the state of Illinois, southern Wisconsin and western Indiana. Mr. Mulligan will cover an adjoining area which includes eastern Indiana, western Ohio, southern Michigan and Kentucky.

Formerly purchasing agent for Fitzpatrick Brothers in Chicago, Mr. Brown served as mechanical liaison engineer in the aircraft division of the Goodyear Tire & Rubber Company during the war. He joined Container Corporation's staff in October 1945 to assume charge of sales service in the paraffined carton and pail division.

For ten years prior to his association with Container Corporation of America, Mr. Mulligan was engaged in sales work for the Dennison Manufacturing Company, calling on manufacturers, retailers and jobbers in Missouri and Illinois.

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CHEMICAL AND MECHANICAL WOOD PULP

Paul Bunyan's double-barreled shotgun, made from pulp mill smokestacks, furnished the Big Duck Dinner for the lumber camp. It took ten bulldozers three days to push the wishbones into the garbage pit.

A reproduction of this incident from the fabulous life of Paul Bunyan—the twentieth of a series—will be sent on request. It will contain no advertising.

B. F. D. Force Calls Off Strike Threat

OGDENSBURG, N. Y.—Twelve hours before they were to go on strike for wage increases and adjustments, 280 employes of the B.-F.-D. Company here accepted the company's offer of ten cents per hour base increase plus adjustments.

Meeting here, B.-F.-D. employes, members of Local 211, International Pulp, Sulphite and Paper Workers, A. F. L. failed to meet a two-thirds majority vote to re-affirm their previous demand for 18 cents per hour wage increase and accepted the company offer, which will be retroactive to June 4, 1947.

The union employes had been preparing to go on strike at midnight—the deadline of the 30-day grace period following termination of the old contract on June 4—in a strike that would have crippled groundwood and sulphite paper production in the north until a compromise was reached.

Under the contract agreement, employes will receive ten cents per hour base wage increase and three to five cents shift differential based on a 48-hour week. Six paid holidays were granted the employes, as well as minor adjustments regarding vacations.

The union had first asked, for the employes, a 25-cent general wage increase on the present 75 cent per hour base rate. This figure was later reduced to 18 cents an hour, with similar adjustments to the contract.

Employes of the organization met earlier to study the company's offer of ten cents and, at that time rejecting the offer, voted to strike.

However under the by-laws of the union, a two-thirds majority of its members must vote affirmatively for the strike to become legal. Due to the fact the necessary two-thirds majority was not polled at the later meeting, the company's offer was accepted.

Westvaco Charleston Staff Organizes Its Athletics

CHARLESTON, S. C. — Henry J. Lee, machinist at the West Virginia Pulp & Paper Company here, has been named president of the company's newly-organized athletic association. Other officers elected were "Red" Jennings, vice-president; M. L. Hodges, secretary; and L. F. Thompson, treasurer. Mr. Jennings works in the mechanical department and Mr. Hodges and Mr. Thompson with the administrative staff.

According to Mr. Lee, the new group of some 400 employes plan to incorporate the organization as the Paper Mill Athletic Association. He added that the organization will sponsor such activities as softball and baseball teams, bowling teams, golf and archery instruction, horseback riding, tennis teams, swimming and social functions. First activity planned is a "family basket" picnic Saturday, July 26, at Alh[illegible] Park, Mount Pleasant.

The following employes were elected to the association board of managers: R. L. Downey, E. C. Williams, R. R. Chase, George Weber, J. W. Stevens, Leon Carter, Francis E. Wells and T. P. Ridgill.

ELMER W. COFFEY

who has been appointed plant engineer of the St. Regis Paper Company's Bryant division at Kalamazoo, Mich. He was formerly affiliated with R. R. Donnelley and Son Company; the W. F. Hall Printing Company, and the H. P. Smith Paper Company.

Kleenex Turns In 3 Years Without Accident

NEENAH, Wis.—The Kleenex department, one of the largest converting units at the Kimberly-Clark Lakeview mill, on Tuesday, July 8, attained a safety record of three years without a lost-time accident.

July 8, 1944, marked the beginning of the current record and during that period one and a quarter million manhours were worked. Safety executives of the mill said that the record "shows what can be accomplished with good safety habits."

There were 208 persons working four-hour shift rotations during that time, and workers trained on 650 jobs from 1945 to the present.

Paper Goods Chicago Staff Goes Out on Strike

CHICAGO—A strike of 150 employees of the American Paper Goods Company, envelope and paper cup concern at 4711 Foster Avenue, was reported on July 7, with the strike called, it was said, to obtain wage increases and a union shop contract. It was called by Local 73, AFL General Service Employes Union.

Newsprint Shipments Exceed Production

NEW YORK — Production of newsprint in Canada as reported by the News Print Service Bureau during June 1947 amounted to 355,606 tons and shipments to 375,498 tons. Production in the United States was 67,268 tons and shipments were 66,743 tons. The output in Newfoundland was 30,157 tons and shipments were 49,130 tons making a total North American production of 453,031 tons and shipments of 491,371 tons. Total production in June 1946 was 424,316 tons and shipments were 415,737 tons. North American production in June 1947 was greater than in any June on record.

The Canadian mills produced 190,431 tons more in the first six months of 1947 than in the first six months of 1946, which was an increase of 9.5 percent. The output in the United States was 24,132 tons or 6.2 percent more than in the first six months of 1946; in Newfoundland production was 2,241 tons or 1.2 percent more, making a total increase of 216,804 tons, or 8.4percent more than in the first six months of 1946, and also was higher than in any preceding similar period.

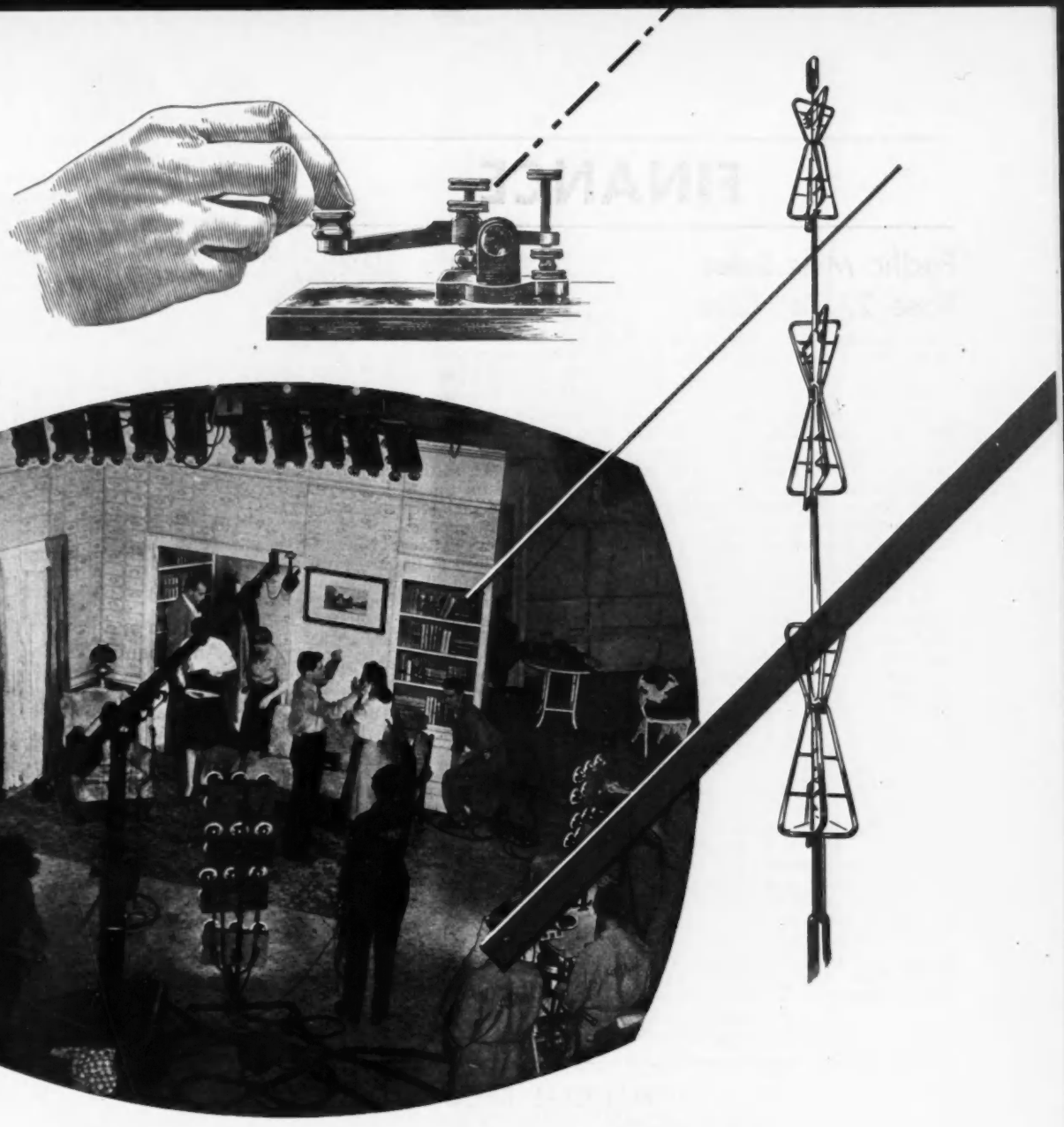
Stocks of news print paper at the end of June were 90,431 tons at Canadian mills, 11,951 tons at United States mills, and 63,436 tons at Newfoundland mills, making a combined total of 165,818 tons compared with 204,158 tons on May 31, 1947, and 199,456 tons at the end of June 1946.

Marathon Executive On Sapeye Program

CHICAGO — The western division of the Salesmens Association of the Paper Industry held a closed meeting for members only on July 7 at the Hotel Sherman. On July 14 the western division heard W. H. Fetridge, vice-president and assistant publisher of *Popular Mechanics* magazine. On July 21, W. Roy Welch, district sales manager of the Marathon Corporation, will talk. Meanwhile, on Friday, July 18, the SAPEYES will hold their second outing of the year, to be held at the Briergate Country Club, Deerfield. Indications are that a good crowd will be on hand for lunch, golf and dinner, according to Lennox Ransom, golf chairman.

Kimberly-Clark Benefits To Be Increased

KIMBERLY, Wis. — Employes of the Kimberly mill of Kimberly-Clark Corporation in a recent referendum favored a proposal to increase weekly benefits in the Kimberly-Clark Mutual Benefit Association from to $12 to $18 per week, with an increased assessment rate of 40 cents per month. The vote was 477 in favor of increasing the benefit and 359 opposing it. The new rate is $2 per month.



look what happened to "sparks"

Glance behind the miracle of wireless images flashed through space and you will see the hand of the pioneer in telegraphy. For video is an extension of the basic principles by which sound was first transmitted electrically. This expansion of pioneer conceptions into vast projects has created many modern industries. As a pioneer producer of electro-chemical products in America, Niagara has improved the quality of these materials and expanded the scope of their utility until they are now...
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FINANCE

Pacific Mills Sales Rose 27 Per Cent

VANCOUVER, B. C.—The thirty-first annual report of Pacific Mills Ltd., for the fiscal year ended April 30, 1947, presents a consolidation of the accounts of subsidiaries, namely, Canadian Boxes Limited, The Hudson Paper Company, Limited, Northern Pulpwood Limited and Badwater Towing Company Limited. After providing for all charges, including depreciation, depletion, amortization and taxes on income, the consolidated net profit was $2,196,028.99, compared with $1,123,-129.65 for the previous year.

The consolidated net earnings on the ordinary shares equalled $27.68 per share after providing for preference dividends. The earnings of the previous year, also on a consolidated basis, equalled $13.38 per share.

Dividends declared in respect of the year's operations comprised the regular dividend of $119,934 or $6 per share on the preference shares, and interim dividends of $450,000 or $6 per share on the ordinary shares. On May 27, 1947, directors declared a final dividend of $150,000 or $2 per share on the ordinary shares, payable June 27, 1947, making a total of $8 per share for the year compared with $6 per share for the previous year.

Sales dollar volume increased 27 per cent to $16,046,249, compared with the previous year, the result of increased production and price increases in newsprint and other paper grades.

Tonnage produced during the year is the highest experienced in the company's history.

Newsprint accounted for 83,053 tons as against 61,964 in 1946. Total of all production was 140,235 tons, up from 116,689 tons a year ago.

At April 30, 1947, consolidated current assets amounted to $6,711,702 or 2.73 times current liabilities of $2,-456,212. Working capital amounted to $4,255,490 and decreased during the year $1,057,442, as the result of heavy expenditures for timber, logging facilities, townsite improvements and plant buildings and equipment.

As in previous years, inventories have been valued at the lower of cost or market, less an allowance for future decline in prices permitted under the Excess Profits Tax Act 1940. This reserve now amounts to $732,000, having been increased during the year by $167,000.

Total expenditures on capital assets aggregated $3,290,000. This includes $1,072,000 for timber, $546,000 for logging facilities, $539,000 for "Martin Inn" and $144,000 for miscellaneous townsite improvements. There was $923,000 expended on improvements to the manufacturing plants, including $159,000 for a zinc hydrosulphite system, $117,000 for a new continuous causticizing plant and $166,000 for power plant improvements.

The Ocean Falls Townsite improvement program, referred to in the report of last year, is progressing satisfactorily. The new hotel building is expected to be ready for occupancy in August, and in commemoration of the late A. B. Martin, former president of the company, will be known as "Martin Inn."

Additions to consolidated properties during the year include assets acquired through the purchase of all capital shares of J. R. Morgan, Limited (a logging company) and its subsidiary, Badwater Towing Company Limited (a log towing company). These acquisitions were made to consolidate our immediate log supply and delivery position. The name of the former company was changed to Northern Pulpwood Limited, to which was transferred all logging assets previously operated by Pacific Mills, Limited, excepting timberland, and the new company acts as our log procuring agency.

The major timber acquisitions during the year included the purchase of the Kitimat timber on the mainland in the vicinity of Ocean Falls, and the Mosquito Lake timber on the Queen Charlotte Islands, adjacent to the company's present holdings.

Wehrman and Pouliot Join In American Paper Bag Co.

HACKENSACK, N. J.—In setting up their new company, the Beacon Paper Bag Company, Inc., in this city, William W. Wehrman and Oliver L. Pouliot are uniting experience that complements each other's ability.

Mr. Wehrman has been associated for the past fifteen years with the Custom-Made Paper Bag Company, Long Island City, as salesman for the metropolitan area and prior to that he was with the Continental Paper Bag Mills. Mr. Pouliot was also with the Custom-Made for thirteen years where he was foreman. He has had previous mill experience both in the New York area and in Maine.

The company is set up to manufacture all types of specialty bags both plain and printed.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending July 12, 1947

STOCKS

	High	Low	Last
A. P. W.	4½	4⅛	4½
Armstrong Cork Co.	47½	45⅞	47½
Armstrong Cork Co., pf.	106	105⅜	105¾
Celotex Corp.	27¼	25⅝	26¼
Celotex Corp., pf.	20½	20¼	20⅜
Certain-Teed Products Corp.	16¾	15¾	16⅜
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	23	22⅜	22¾
Champion Paper & Fibre Co., pf.	106	105	105
Congoleum Nairn Co.	27⅞	27	27⅞
Container Corp. of America	42½	40⅛	42½
Container Corp. of America, pf.	102	101½	101½
Crown Zellerbach Co.	30⅜	29	30
Crown Zellerbach Co., pf. 4.20	103¾	102½	103¾
Crown Zellerbach Co., 4 pf. 4	115	112½	115
Dixie Cup Co.	33½	31½	33½
Dixie Cup Co., A	54	54	54
Flintkote Co.	33⅞	31½	33¾
Flintkote Co., pf.	107	107	107
Robert Gair	7⅞	7¼	7⅞
Robert Gair, pf.	20	19⅝	20
International Paper Co.	49½	46¾	49
International Paper Co., pf.	106½	105	106½
Johns-Manville Corp.	44½	43¼	44⅜
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	24¾	23¾	24¾
Kimberly-Clark Corp., pf.	107⅞	106⅜	107½
Mac Andrews & Forbes	36⅞	36¾	36¾
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	26¼	25½	25⅞
Mead Corp.	20⅞	19¼	20⅞
Mead Corp., pf. 4¼	....	....	....
Mead Corp., pf. 2	47	47	47
National Container Corp.	40¾	38¾	39
Paraffine Companies, Inc.	70	70	70
Paraffine Companies, Inc., pf.	109	109	109
Rayonier, Inc.	23	21¾	23
Rayonier, Inc., pf.	37	36½	36½
Ruberoid Co.	56½	52	55½
Scott Paper Co.	45	44	44
Scott Paper Co., pf.	100⅜	100	100
Sutherland Paper Co.	41½	40½	40½
Union Bag & Paper Corp.	33⅝	31¾	33
United Paperboard Co.	14¾	14	14¾
U. S. Gypsum Co.	106	104¼	105
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	40¾	39	40¾
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp., 3¼s '60	....	....	....
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	....	....	....
Mead Corp., 3s '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending July 12, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	42¼	42	42
St. Regis Paper Co.	....	....	....
Taggart Corp.	9⅞	8¾	9⅞

BONDS

American Writing Paper Co., 6s '61	....	....	....

Didn't you *Know* ?

"Moore & White is under new management." . . . "Moore & White is revolutionizing its manufacturing facilities." . . . "Moore & White is re-designing its famous winders." . . . "Moore & White is rejuvenated."

But didn't you *know* . . . and hadn't you *heard?*

It's true—every bit of it.

Never in the history of this company have we been better equipped with engineering ability, production manpower, and manufacturing facilities to design, build, install, and maintain the machinery you need to make more and better paper for your expanding markets.

Never in the history of this company have we been better set up to make delivery promises and to keep the promises we make.

Yes. Moore & White has a new lease on life . . . and the one thing that has helped as much as anything else to accomplish that has been the good wishes and support of this company's fine old customers.

You need new machines and equipment now? Then, by all means, ask us to help you.

The MOORE & WHITE Company

15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM BUILDERS OF PAPER-MAKING MACHINERY

Hadn't you *Heard* ?

Scott Peps Up Men With Visit to Mill

PHILADELPHIA, Pa. — Completing a month of orientation at the Scott Paper Company's Chester plant, retail trade salesmen Willard Beck, Bob Burriss, John Carroll and Doug Fish have returned to their respective territories filled with enthusiasm generated by their experiences at the Chester plant.

All four men gave generous praise in behalf of the people and the operations with which they were associated over the period.

"The time I spent at Chester," said Burriss, Memphis district manager, "was extremely worthwhile. I was impressed by the high caliber of the folks in all departments, by their attitude, by their conduct and by their friendliness toward one another and toward me. Everything I observed points to continued leadership as a productive and administrative team. I am returning to my territory with renewed faith in the future of this business."

Los Angeles retail salesman Willard Beck was enthused over the acceptance of the quality concept by the men and women in the manufacturing division. "Even though I have been selling 'quality' to my customers in the field, I never realized the thoroughness with which this ideal is pursued at Chester. The eagerness of our people to produce the best is certainly evident." Beck also commended the high degree of cooperation between all groups which has promoted their smooth operation as a single unit.

Carroll, formerly a member of the finishing department, and now Buffalo retail salesman, noted the splendid relationship between the finishing people and the consumers' representatives. "Everyone is working for quality, helping one another to produce the best possible product. There is better-on-the-job training today than ever before, and operations are performed with more efficiency and ease. Throughout the plant, I had the feeling that people were willing to do more than the job to which they were assigned. This fine team spirit and willingness to help the other fellow has paid off in more production and better products, two things which make the salesman's job easier."

Brooklyn retail salesman Doug Fish complimented the members of the Consumers' Representatives Department on the manner in which they function. He also had high praise for the effective way in which production people practiced self-inspection. "Guess work has been eliminated at Chester, too, and everything is done with a scientific approach. I certainly feel that I am part of a team which includes the fourth hand who said to me, 'We're here to help you, for by helping you we help ourselves.' It's this spirit so well expressed that has given us even more confidence in our first line of defense—quality."

The salesmen spoke highly of those who developed the orientation program idea both for its effectiveness and interest. They cited, too, the cooperation of the members of groups allied with sales, such as Sales Accounting, Traffic, Sales Correspondence, Advertising, Distribution Research and Credit

The program closed with a golf outing at Rolling Green Country Club, after which the men returned to their sales territories.

House Votes Funds To Avert Floods

HOLYOKE, Mass. — Paper manufacturers throughout the Connecticut Valley, victims of extensive damages in 1936 when the Connecticut River overflowed its banks and inundated large industrial areas, have been notified that the United States House of Representatives has voted funds totaling $803,000 for further work on the construction of the Connecticut River Flood Control program, following debate of the War Department Civil Functions Appropriations Act for the fiscal year of 1948.

The House provided $340,000 for continuing construction of the Tully Dam on the Millers River; $100,000 for work on the dam at Union Village, and $293,000 and $70,000, respectively, for local protective works at Hartford, Conn., and the Springdale section of Holyoke.

Representative Charles R. Clason (R-Mass.), author of the legislation which has made the Connecticut River flood control program possible, said he was "gratified to note that construction will continue on a large scale in the Connecticut River basis in the comprehensive federal flood control plan.

"In view of the terrible floods now visiting the Middle West it is obvious that we are fortunate in securing the construction of additional protective works in the Connecticut Valley at this time," Congressman Clason said.

"It is interesting to note that the floods in the Middle West have topped all floods for more than a century. Along the Conecticut River we have build local works which are three feet higher than the crest of any recorded flood in the valley, while each flood control reservoir will give additional protection not only to the cities but to every community along the river's banks."

Eagle Lodge Proposes Moore

HOLYOKE, Mass. — Holyoke's Eagle Lodge, No. 1, branch of the International Brotherhood of Papermakers, AFL, has nominated Edward M. Moore of this city, union organizer and former Eagle Lodge officer, for election as sixth vice-president of the International. Local 226, the other local branch, has also endorsed Moore's candidacy. Officers of the International will be elected by mailed ballot between Oct. 1 and 12.

Kaukauna Starts Work On New Power Plant

KAUKAUNA, Wis. — Construction of the City of Kaukauna's new hydroelectric plant in the village of Combined Locks at the south end of the Little Chute dam has been begun. The rock excavation on the site is nearly completed, according to Wilson Milbrandt, construction engineer of the C. R. Meyer and Sons Company of Oshkosh, Wis., the contractors. The coffer dam has been completed as far as the intake section is concerned, and work of pouring concrete was to be started this week for the new power house.

More rock excavation will be done on the down-stream section for the tail race, a distance of about 1,000 feet from the first intake coffer dam. The second coffer dam will have a superstructure on which the power house is to be built.

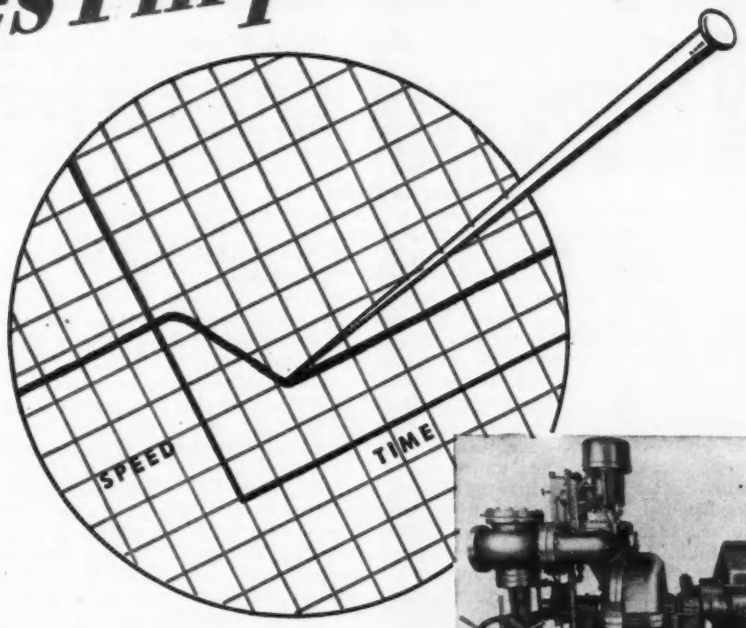
Construction of the plant, which will provide a considerable amount of power for Thilmany Pulp and Paper Company at Kaukauna and the Combined Locks Paper Company, will continue through the coming winter. The first power unit is expected to be ready for installation in December.

The plant will include three 1,655 horsepower turbines and three 1,100 kilowatt generators. The improvement includes the building of a new 12,000 volt line from the plant site to the Combined Locks Paper Company, about a mile distant, where it will be connected with the present circuits that supply power for the paper mill's operation.

Reservoir Assessments Add to Rensselaer Costs

COHOES, N. Y.—The tax levy against industrial firms in Rensselaer County for the maintenance and cost of the Sacandaga Reservoir during 1947 will amount to $11,791. The Mechanicville branch of the West Virginia Pulp & Paper Company is assessed for $229 while the New York Power & Light Company is assessed $162, $492 and $1,505 at Schaghticoke. The Green Island plant of the Ford Motor Company, Inc., is assessed for $11,047. The huge reservoir was constructed several years ago by the state at a cost of about $12,000,000 in order to eliminate flood dangers and has also proven of great benefit to paper manufacturing firms by allowing them to maintain operations during periods of drouth. Many of the prominent paper concerns in Washington and Warren counties are also assessed yearly amounts for the maintenance of the reservoir. Among these are the Fort Miller Pulp & Paper Company, Union Bag & Paper Company, International Paper Co., International Pulp & Paper Company, Finch, Pruyn & Company, and others.

Here's Pin-point Accuracy



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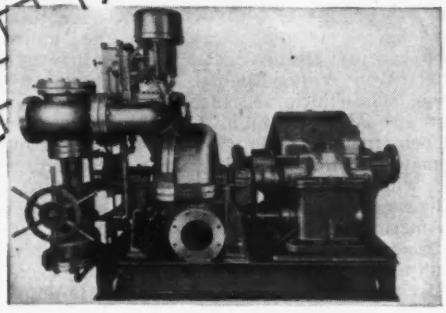


TURBINE DRIVE HOLDS SPEED WITHIN 1/10 OF 1%

The new electric governor used in the Type DE steam turbine has demonstrated pin-point accuracy far in advance of previous turbine controls. Under constant steam and load conditions, this governor will hold drive speed within 1/10 of one per cent.

Such accuracy in your machine drives can really pay off in greater output and improved quality control.

NO HUNTING

The electric governor changes turbine speed quickly and smoothly. It eliminates hunting or speed fluctuation.

SPEED RANGE 30:1

Accuracy is not limited to a narrow speed range. The drive can be operated over speed ranges as great as 30 to 1. Thus the drive gives versatility to your processing machines—enables them to handle special jobs with ease.

SIMPLE CONTROL

Speed is changed by simple push-button control. Where frequent speed changes are anticipated, "pre-set" control, with separate push buttons for pre-selected speeds, can be provided.

GIVE YOUR OUTPUT A BOOST

Our turbine specialists will be glad to show you how this highly accurate, wide-range drive can step up the output of *your* processing machines. Get in touch with the nearest G-E Apparatus Sales Office, or write Apparatus Department, General Electric Co., Schenectady 5, N. Y.

GENERAL ELECTRIC

252-19

Pacific Mills Expands Its Kraft Program

VANCOUVER, B. C.—With most major projects in Pacific Mills' $5 million post-war expansion program either completed or near completion, the company has made known that additional expenditures of $550,000 will be made in plant improvements and community development at Ocean Falls.

The largest immediate individual expenditure, $130,000 will be made in Pacific Mills' Ocean Falls kraft mill, the only kraft paper mill in Canada, west of Ontario. The mill's present three 2½-ton capacity rotating digesters will be replaced by new heavy-duty rotating digesters of 3½-tons capacity each. A fourth 3½-ton digester was installed earlier as a part of the company's original post-war expansion program.

These digesters, which are being manufactured in Vancouver, B. C., by Vancouver Iron Works Limited, have walls two inches thick, are 12 feet in diameter and 22½ feet high. Of all-welded construction, they will weigh approximately 30 tons each, and, when installed, will be among the largest rotating digesters currently in use in the North American kraft paper industry.

With four 3½-ton digesters in operation, and with certain necessary modifications completed in its screening and beating processes, the company expects to increase its kraft pulp production from a present 140 tons daily to 175 tons a day. The larger digesters will also permit longer "cooking" time, which will result in improvement of the quality of kraft fibre produced.

The two-inch walls, one-half inch thicker than those of the earlier digesters, will provide additional resistance against the corrosive effects of pulping chemicals, and will also permit the use of higher steam pressures in the cooking process.

The sum of $104,000 has been budgeted for new asbestos-lined aluminum sectional hoods for the plant's two high-speed newsprint paper machines. These operate at 1,200 feet per minute, and produce approximately 80,000 tons of newsprint annually.

The hoods, which will greatly reduce fire hazards in the mill's newsprint section, will also provide more uniform conditions for paper drying. By removing excess vapors they will create more pleasant working conditions for paper machine operators, and will reduce corrosion of the machine room's steel roof members.

Another important factor will be the clean, streamlined appearance of the big paper machines when the hoods are installed. This improved appearance will extend throughout the entire machine room, as the reduction of moisture content in the air will make it possible to paint the whole interior in approved industrial "dynamic" color patterns.

A similar hood is to be installed on the company's No. 4 paper machine, which is producing specialty grades of sulphite and sulphate papers. This hood will cost $28,000.

The Montreal division of J. O. Ross & Company is supplying the three paper machine hoods.

A noteworthy change in Pacific Mills' present production program will result from an $80,500 conversion job on the company's No. 6 Fourdrinier pulp-drying machine. This machine's production has been confined to sulphite and sulphate machine-dried pulps, but, when converted, it will also manufacture such coarse grades of paper as .021 and .031 chipboard, core papers and millwrap.

Previously, these papers have been made on a part-time basis on No. 3 specialty machine. This system resulted in two drawbacks: first, the machine's overall production record was reduced, as the manufacture of coarse papers is necessarily a comparatively slow process; and second, for a short period after each changeover, a somewhat adverse effect was noticed on subsequent runs of finer grades.

Both these handicaps will be overcome with the mill's coarse paper production concentrated on No. 6 machine. This machine will, of course, continue to produce machine-dried pulps.

Important economies in heat consumption and chemical usage in the plant's sulphite mill will be effected by the installation, at a cost of $73,000, of a spherical hot-acid accumulator with a diameter of 25 feet.

To be used in the sulphite mill's chemi-pulp system for the absorption of hot relief gases and to provide more uniform cooking conditions, the new accumulator will release one of the plant's sulphite digesters, currently being used as an accumulator, for full-time pulp cooking. With three digesters performing the pulp cooking function, it is estimated that the sulphite mill's total production will increase from 68 to 100 tons a day.

The over-all result of the installation of this hot-acid accumulator and the operation of a complete circulation system will be to provide Pacific Mills with fully modern digester room equipment in its sulphite mill.

Despite increased production, lower chemical usage and substantial heat economies are anticipated, and, what is even more important, the already high quality standards of the mill's various sulphite paper products will be still further enhanced.

The company's supplementary improvement program for its Ocean Falls townsite will be highlighted by the construction of nine new duplex-type dwellings for employees and their families. These attractively designed and fully modern housing units will cost $135,000.

This project is being made possible by completion this summer of Ocean Falls' new million-dollar hotel, "Martin Inn." When opened, the hotel will provide accommodation for the occupants of several dormitory buildings now located along the community's western waterfront district.

Two major undertakings for Ocean Falls are now in the planning stage—the construction of a community center and modernization of Pacific Mills' department store — but no definite date has as yet been set by the company for beginning this work.

However, it is not expected that it will be long delayed. A community center building for Ocean Falls has been under consideration by company officials for some time, and architects' drawings are now being prepared.

The department store, with a staff of nearly 100 has been outgrowing its premises and service facilities for the past several years, and the company realizes that considerable enlargement and modernization have become necessary if the store is to meet the community's ever-expanding needs.

Todd Opens Branch Plant To Serve Southwest

ROCHESTER, N. Y.—The Todd Company will open a new $250,000 building in Dallas, Tex., August 15 for check manufacturing and sales in the Southwest, according to A. Richard Todd, executive vice-president. "This is another step in our decentralization of check-manufacturing operations," Todd said. "The greater facilities available will enable us to localize our operations to take care of the particular needs of southwestern banks and their business customers."

The building is constructed of white pressed brick and has air-conditioning, fluorescent lighting and showers for plant workers. It covers 13,500 square feet and initial equipment will include 16 to 18 presses.

The Texas plant, which will serve Texas, Oklahoma, Arkansas and Louisiana, is one of nine branch plants in the United States and one in Canada, besides the main plant and executive offices in Rochester.

Holyoke Plants Install New Elevator Equipment

HOLYOKE, Mass. — New elevator equipment and repairs will be made in two local paper industrial plants, according to permits issued at the city engineer's office. The Parsons Paper Company, on Sargeant street, will install an hydraulic freight hoist valued at $6,600, while the National Blank Book Company will make a similar installation and also repair the elevator hatchway for a total cost of $5,500.

COATED PAPER MILLS REPORT...

Important Benefits from use of Nopco* ESI

New Aqueous Dispersion of an Insoluble Metallic Soap

DATA BASED ON RECENT SPOT CHECK ANALYSIS OF MILLS USING NOPCO ESI IN VARIOUS PARTS OF THE COUNTRY.

Other Known Advantages

Applicable in either conventional coating or paper machine coating process.

May be used in either casein or starch coatings.

Readily diluted in water to any desired concentration . . . gives a dispersion stable to both mild acids or alkalis.

Thoroughly plasticizes pigment particles even after coating has dried . . . important for eliminating a troublesome dusting problem.

*Reg. U. S. Pat. Off.

FIRST MILL... *4 benefits reported* . . . (1) improved brightness and gloss on paper machine operations; (2) improved flow characteristics; (3) uniformly smoother coating; (4) reduction of dusting problems at calender stack.

SECOND MILL... *4 benefits reported* . . . (1) improved brightness and gloss on clay coating compositions; (2) better flow characteristics; (3) final coating of improved smoothness; (4) elimination of dusting problems at the supercalenders.

Other users report that Nopco ESI also aids in controlling foam in coating formulations.

11 MILLS... reported "ordering regularly" . . . over 50% of the mills contacted during survey.

If you—in common with many other mills—have difficulty in obtaining uniformly satisfactory performance from clay coatings—write for complete particulars on NOPCO ESI.

Nopco Chemical Company, Harrison, N. J.

Formerly National Oil Products Co.

Branches: BOSTON • CHICAGO • CEDARTOWN, GA. • RICHMOND, CALIF.

An Affiliate of the American Pulp and Paper Mill Superintendents Association

Aqueous Dispersion of an Insoluble Metallic Soap

NOPCO EVOLVED THROUGH RESEARCH

NOPCO ESI

Gurley Enlarges Its Reticle Department

TROY, N. Y.—W. & L. E. Gurley, century-old manufacturers of engineering instruments, has enlarged its reticle-making department to contract-manufacture glass reticles for all types of optical measuring instruments, C. I. Day, president, announces.

Until recently, Gurley made reticles solely for its own requirements, following its development, during the war, of special-type glass reticles to replace platinum wire in surveying instruments. This was a natural outgrowth of the company's extensive experience in optics, lens grinding and scientific instrument manufacture. Gurley was the first to introduce platinum-wire reticles, in 1875 which, in turn, supplanted the use of spider webs.

In the course of setting up its glass reticle department, Burley designed and produced special manufacturing equipment and introduced new photographic, microscopic ruling and etching methods. Added to these facilities is an advanced photographic process developed during the war, to meet the stringent accuracy requirements for reticles in bombsights and gunsights.

THE 300TH LAWSON 38 DELIVERED

The 300th Lawson 38 Paper Cutter, manufactured during 1947, was recently delivered from E. P. Lawson's New York showrooms to the Queen Ribbon & Carbon Co., Brooklyn, N. Y. Shown supervising the loading operation are (left) Lawson's Chief Engineer Fred Seybold, who designed the Lawson 38, and W. J. Hourigan, Treasurer of E. P. Lawson Co.

Hercules P.M.C. Department Shifts McClaire and Reeves

WILMINGTON, Del. — The Paper Makers Chemical Department of Hercules Powder Company made two personnel changes in its sales organization. J. Huston McClane of the department's sales office in Atlanta, Ga., has been transferred to Kalamazoo, where he will be engaged in sales activities in connection with Hercules chemicals for the paper industry. Henry Reeves, who has been a sales representative in the Kalamazoo territory, will succeed Mr. McClane as acting manager of the Atlanta office.

Mr. McClane has been a member of the PMC department since 1939. He was first employed in the Atlanta sales office and then was transferred to Kalamazoo. In May, 1942, he joined the Army and served until January 1946. He was a major when he returned to civilian life and was awarded the Bronze star for service while in Italy. He returned to the Atlanta sales office in January 1946.

Mr. Reeves joined Hercules in 1935 as a chemist at the Experiment Station. He spent several years at the Paper Makers Chemical plant in Kalamazoo before being moved to the home office in Wilmington in 1941. From 1944 to 1946 he worked in several of the Hercules-operated ordnance plants and then returned to the Paper Makers Chemical department Kalamazoo office in March 1946.

Witco basic products are developed and produced through a program of research, pilot plant investigation and scientific manufacturing methods. As a result, the finished products made with Witco materials . . . by their outstanding performance . . . will effectively meet the highly competitive, hard-selling era that lies ahead.

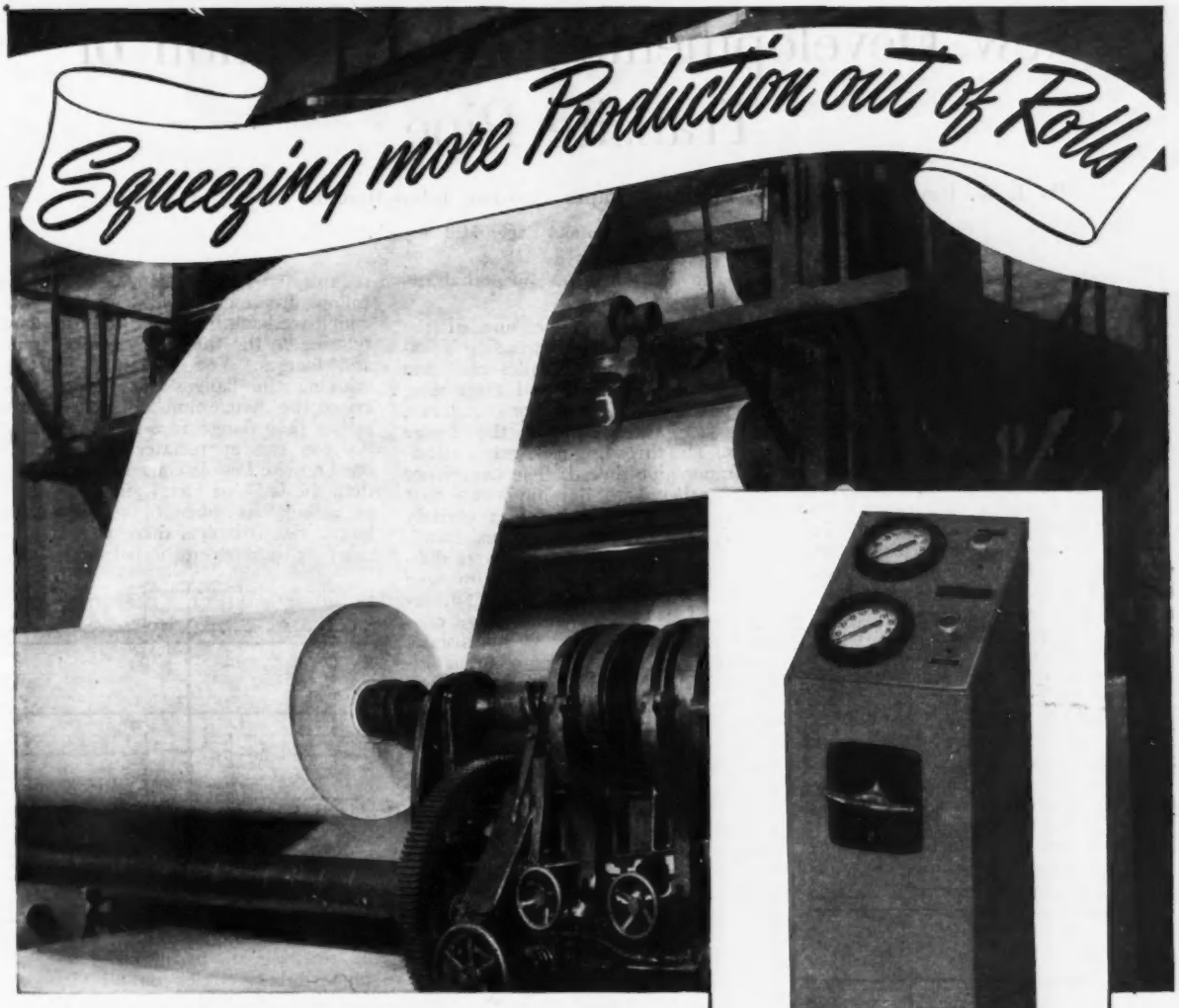
If you have a basic-materials problem in any of your products, Witco's modern technical service and research facilities can give you reliable assistance. And we shall be glad to send you literature and samples at your request.

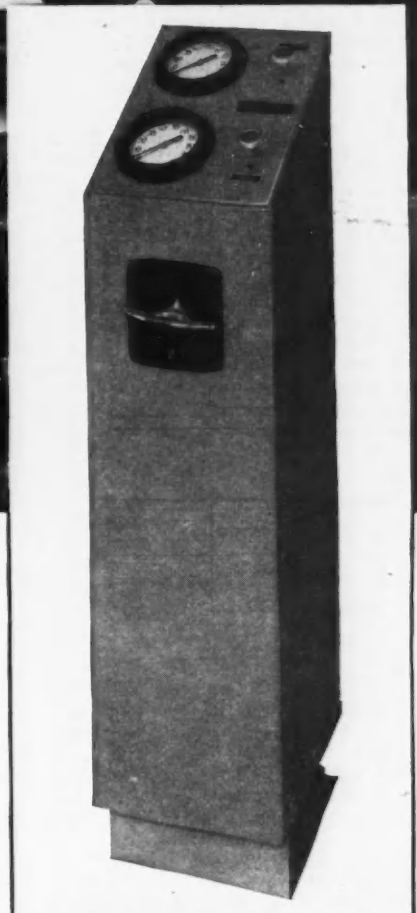
WITCO CHEMICAL PRODUCTS FOR THE PAPER INDUSTRY
CARBON BLACKS • PIGMENTS • FILLERS • BLANC FIXE • MICAS • ASPHALTS • EMULSOBLAK

WITCO CHEMICAL COMPANY
MANUFACTURERS AND EXPORTERS
295 MADISON AVENUE • NEW YORK 17, NEW YORK

BOSTON • CHICAGO • DETROIT • CLEVELAND • AKRON • LOS ANGELES
SAN FRANCISCO • LONDON AND MANCHESTER, ENGLAND

Squeezing more Production out of Rolls





In this new, streamlined Foxboro Control Cabinet, adjustments in load, venting, and reloading of air cylinders, or lifting of the top roll, are accomplished without lost time or physical effort. Cabinets are available in single and dual units. Instruments for remote recording of loading pressures can also be furnished if desired.

FOXBORO PNEUMATIC LOADING

● *ON CALENDARS,* Foxboro Pneumatic Loading maintains better and more uniform finish, with fewer breaks. On *press rolls,* it assures maximum moisture extraction, and *uniform* extraction across the sheet.

This modern roll-loading system gives calibrated cushioned roll pressure with convenient fingertip control . . . a turn of an air switch to load, unload, or lift the roll; a turn of two knobs to adjust exact pressure at each end of roll. Then, constantly uniform air pressure compensates for variations in material thickness, and for out-of-roundness of rolls—snubs tendency to bounce. Thus higher roll speeds with less broke are practical.

Here's a proven method for improving quality, for extending felt and roll life, and for saving steam. Get complete facts. Write for Bulletin B306. **The Foxboro Company, 114 Neponset Ave., Foxboro, Mass., U. S. A.**

FOXBORO REG. U. S. PAT. OFF. **PNEUMATIC LOADING**

New Developments in the Erection of Transite Pipe

By J. W. Hemphill, Manager, Pulp and Paper Division, Johns-Manville Sales Corporation

From an address before the American Pulp and Paper Mill Superintendents Association

Transite Pipe has found considerable acceptance in the Pulp and Paper Industry for water, white water, washed pulp, stock and some recovery process lines. One of the great difficulties has been that the manufacturers of this pipe have not been able to offer the industry a complete piping system. So far, they cannot furnish fittings made from Transite and it has been necessary to use fittings of various metals in order to complete the system. The industry itself has been sufficiently interested in the use of Transite Pipe to do considerable development on their own, and it is these new developments that we wish to talk about.

In this discussion we also wish to limit our talk to the erection of Transite Pipe in overhead piping systems. The use of Transite in underground systems, with the Simplex Coupling (Fig. 1), has proven to be practical and entirely satisfactory.

Before discussing the later developments, we would like to review the early developments in couplings for Transite Pipe. The earliest coupling

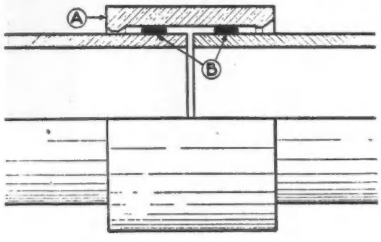


FIG. 1

that was offered to the industry for above ground piping was the Tee-Tite Coupling, which was, as most of you know, developed by one of the large paper mills. (Fig. 2.) The Tee-Tite coupling is quite satisfactory from an operating standpoint, and has had, and will continue to have, considerable acceptance in the industry. The flanged Simplex Coupling was offered at a later date and has the advantage of being easier to assemble, is cheaper, but has two fundamental drawbacks—the coupling had to be rodded in order to be certain that the pipe would not pull apart under pressure-surge conditions, and the annular space around the outside of the coupling permits the lodgment of stock which might eventually ferment and cause slime and other infectious growths to get into the system. (Fig. 3.) The Fleck Coupling, somewhat similar to ring and follower type (Fig. 4) which is used to some extent in the Canadian mills, has essentially the same fundamental drawbacks.

About ten years ago one of the Canadian mills started threading Transite Pipe, screwing parallel cast iron flanges onto the pipe and assembling the pipe in the conventional manner, using a gasket between the flange faces. The threading used was a standard taper pipe thread. The experience data gathered to date indicates that this type of coupling has been entirely satisfactory from an operational standpoint. While we have had some difficulty due to surges and unforeseen operating conditions, we have no record of ever having had a flange coupling strip its threads. All hydrostatic tests run on this type of coupling indicate that the pipe will fail before the flanges will strip off the pipe. We wish to mention that only Class 150 Pipe is being used for the threaded type of coupling. Since all pipe is tested at four times its working pressure, the hydrostatic tests on this type of coupling, with Class 150 Pipe, showed the pipe breaking at something over 600 p.s.i. with the couplings remaining intact. It is our opinion that pipe made for lower operating pressure conditions does not have sufficient wall thickness to carry the thread with safety.

Over the past several years, the use of the threaded coupling as a means of connecting Transite Pipe has spread considerably throughout the paper mills and while each mill has its own ideas regarding details for threading pipe, they all seem to have been able to work out a threaded flanged coupling that is satisfactory for their particular use. By variations in details we mean the number of threads per inch, some use tapered threads, others use straight threads. For example, we understand in the Wisconsin area many of the mills are using six threads per inch

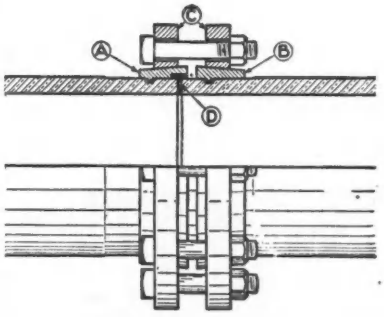


FIG. 2

regardless of size of pipe. Other mills follow drawing TP1-2M (Fig. 5) in which we have indicated essential data relating to the threading of both pipe and flanges. You will note on this drawing the flanges are reversed to bring the flange hub to flange hub, rather than flange face to flange face. As you can appreciate, the O.D. of the Transite Pipe is considerably larger than the O.D. of metal pipe and when an attempt is made to assemble the larger sizes of pipe, there is not sufficient space between the bolt circle and

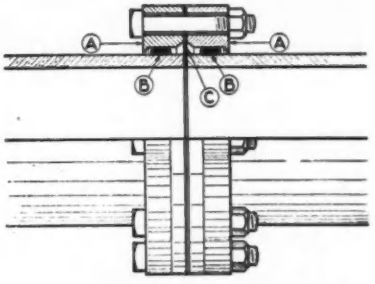


FIG. 3

the flange hub to thread on the nut. By reversing the flanges, as shown on the drawing, it permits the use of standard bolt circles on all sizes of pipe and precludes the necessity of using adaptors when making connections to fittings in the larger diameters. So far we have not been able to develop a better method of threading Transite Pipe than chucking the pipe in a lathe and chasing the thread on the pipe with a lathe tool. Development work is in progress which indicates the possibility of cutting the threads with special dies, using standard pipe thread cutting equipment.

In cutting the threads on a lathe, experience indicates the necessity of using carboloy tipped cutting tools, ground to the exact shape of the thread required. However, the same tool that is used for chasing the thread can be used for turning down the O.D. of the pipe to correct dimensions and taper. Cutting speeds of something over 100 ft. per minute have been found most satisfactory in threading Transite Pipe. In the threading of the pipe, it is important not to attempt to cut the thread in one operation, as the material has a tendency to tear. Generally speaking, six to eight cuts of the tool are required to develop a clean, smooth thread of the proper depth. Some mills prefer to cut threads dry, while others use water on the tool—still others have found oil and graphite an excellent

Calgon*

Controls Corrosion

This graph illustrates the effect of various concentrations of Calgon in inhibiting steel corrosion.

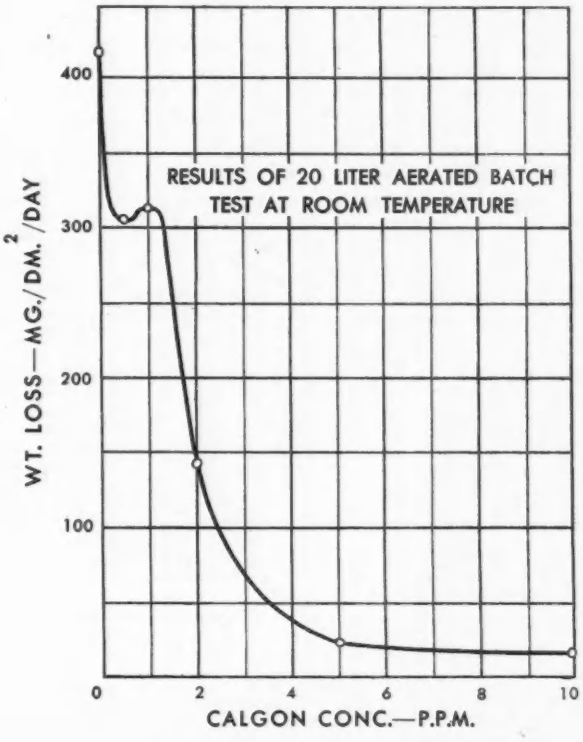
The peculiar hump in the curve was confirmed by several duplicate tests. It may be due to the coagulating effect of a very low concentration of Calgon, which might produce a slight increase in the protective action of the rust film. At higher concentrations a peptizing action is obtained.

This curve was obtained from 20-liter aerated batch tests at room temperature. In continuous or intermittent flow systems, comparable results are obtained with lower concentrations of Calgon. In actual service optimum concentration may be higher or lower than the curve indicates, depending on a variety of conditions.

Calgon is now used in thousands of applications, municipal water systems, cooling systems, industrial process waters, etc. As iron in solution is troublesome in paper-making processes, a method for eliminating or controlling this iron is desirable.

Write us for further information regarding the application of this process to your problem.

**T. M. Reg. U. S. Pat. Off.*



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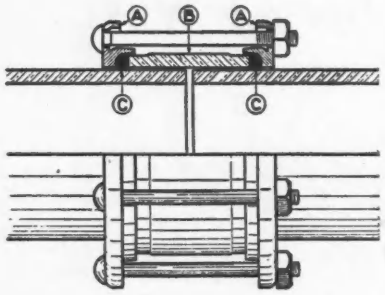


FIG. 4

lubricant in cutting operation. Our own experience would indicate that the oil and graphite is a satisfactory lubricant.

It is hardly possible that the manufacturer of Transite Pipe will ever furnish threaded pipe from their factories. The problem of thread protection in shipping, and the fact that so many closures would have to be made in the field, precludes consideration of factory threading.

A threaded coupling has the advantage of being a rigid coupling which requires fewer hangers and less sidebracing. A threaded coupling is also a type of coupling that the pipe fitters are used to handling and in most cases get along with it quite successfully. It also has the advantage that where a change is to be made in the mill, the pipe can be readily assembled on the floor and rapidly erected in place at the time of shutdown.

The poured flange coupling is another new development in the Pulp and Paper Industry that is not only interesting, but has great possibilities as well. Here again we are largely reporting the results of the use of the poured flange coupling in one of the larger paper mills in the Kalamazoo district. Approximately two years ago the chief engineer of this mill designed a lightweight flange coupling, as per sketch (Fig. 6). You will note that this casting contains ribs which serve as a means of anchoring the flange in the pouring compound. You will further note that the hub of the flange coupling is sufficiently large to

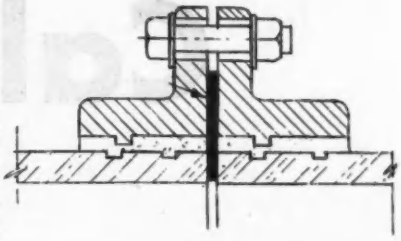


FIG. 6

fit over the rough barrel of the Transite Pipet by means of a simple jig, the flange casting is centered with respect to the I.D. of the pipe. The only machining necessary on this flange is the machining of the face of the flange to take the gasket. So far as Transite Pipe is concerned, the only work that needs to be done to the Transite Pipe is squaring of the ends of the pipe and the possible necessity of cutting two or three circumferencial shallow grooves in the pipe to provide anchor for the pouring compound. All this work could be easily done by means of a Pilot cutting tool which is readily available. The cutting of the Transite Pipe to length to make closures can also be accomplished with this same cutting tool.

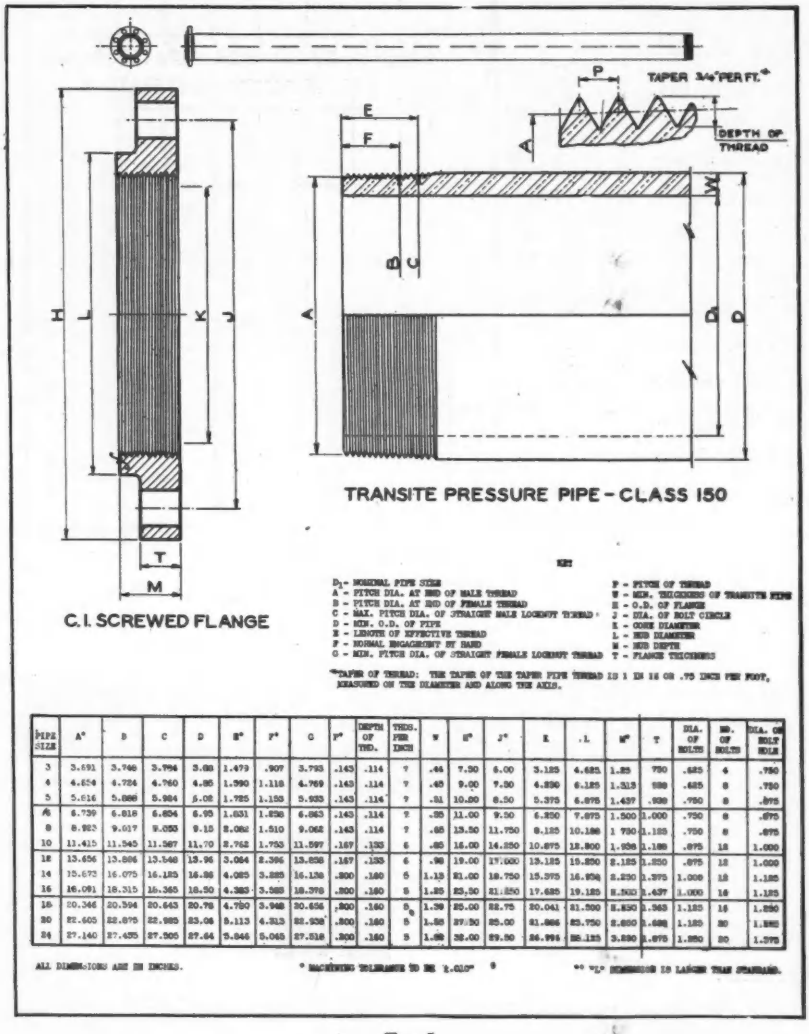
As a note of precaution, the surface of the pipe immediately under the flange coupling should be cleaned, all loose materials removed, and it might not be a bad idea to rough the surface with an ordinary heavy rasp or coarse file.

The pouring compound used can be any one of the several sulphur base compounds, known by such trade names as "Leadite," "Mineralead," etc. The pouring of the flange is done on any smooth surface such as a face-plate and the pouring is done in the conventional manner. The pipe is ready for bolting in place without any further processing.

Preliminary tests indicate that properly poured flanges will likely stand as much pressure as a pipe which, as previously stated, is tested at pressures of 600 p.s.i. So far, these couplings have withstood hydraulic pressures above 400 lb without showing any signs of flange failure. The use of rubber gaskets between the flanges precludes the necessity of the pouring compound being totally watertight and eliminates the possibility of liquids carried by the pipe attacking the sulphur base material.

The poured flange coupling seems to have the possibility of being practical and at the same time a lower cost method of coupling Transite Pipe.

With regard to fittings, would advise that an intensive effort is being made, both by the manufacturer of Transite Pipe and several of the mills, to develop a practical and relatively inexpensive Transite fitting and am pleased to report that definite progress is being made in this direction. However, the test work has not progressed sufficiently far at this time to be reported.



KEY

D_1 - NOMINAL PIPE SIZE
A - PITCH DIA. AT END OF MALE THREAD
B - PITCH DIA. AT END OF FEMALE THREAD
C - MAL. PITCH DIA. OF STRAIGHT MALE LOCKNUT THREAD
D - MIN. O.D. OF PIPE
E - LENGTH OF EFFECTIVE THREAD
F - NORMAL ENGAGEMENT BY HAND
G - MIN. PITCH DIA. OF STRAIGHT FEMALE LOCKNUT THREAD
P - PITCH OF THREAD
W - MIN. THICKNESS OF TRANSITE PIPE
H - O.D. OF FLANGE
J - DIA. OF BOLT CIRCLE
K - CORE DIAMETER
L - BED DIAMETER
M - BED DEPTH
T - FLANGE THICKNESS

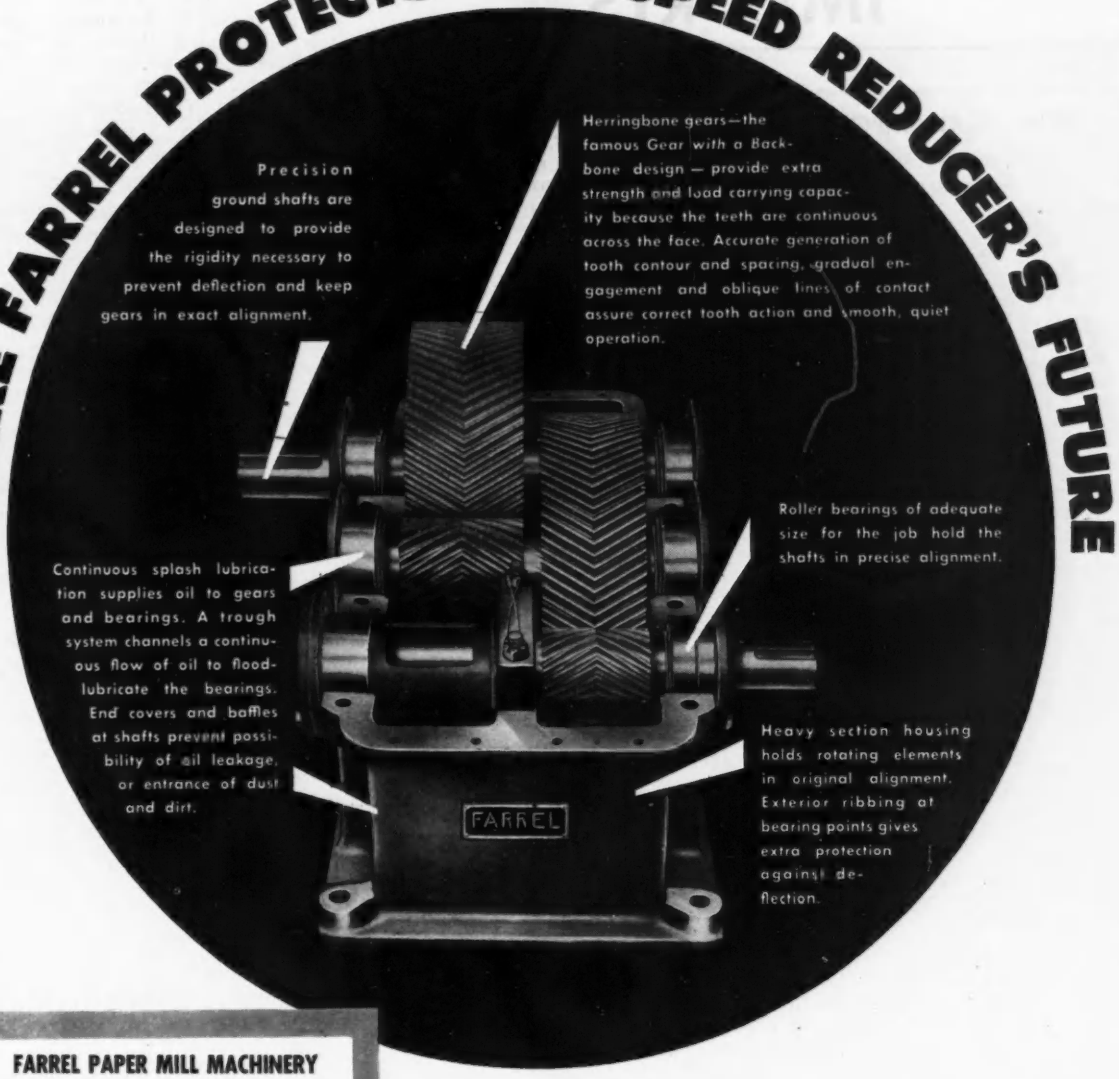
*TAPER OF THREAD: THE TAPER OF THE TAPER PIPE THREAD IS 1 IN 16 OR .75 INCH PER FOOT, MEASURED ON THE DIAMETER AND ALONG THE AXIS.

PIPE SIZE	A*	B	C	D	E*	F*	G	F*	DEPTH OF THD.	THDS. PER INCH	W	H*	J*	K	L	M*	T	DIA. OF BOLTS	NO. OF BOLTS	DIA. OF BOLT HOLE
3	3.691	3.748	3.794	3.80	1.479	.907	3.793	.143	.114	7	.44	7.50	6.00	3.125	4.625	1.25	750	.625	4	.750
4	4.854	4.724	4.760	4.85	1.990	1.118	4.789	.143	.114	7	.45	9.00	7.50	4.250	6.125	1.313	938	.625	8	.750
5	5.816	5.886	5.924	5.08	1.725	1.153	5.933	.143	.116	7	.51	10.00	8.50	5.375	6.875	1.437	.938	.750	8	.875
6	6.739	6.816	6.854	6.95	1.631	1.838	6.863	.143	.114	7	.55	11.00	9.50	6.250	7.875	1.500	1.000	.750	8	.875
8	8.923	9.017	9.055	9.15	2.082	1.510	9.062	.143	.114	7	.65	13.50	11.750	8.125	10.188	1 750	1.125	.750	8	.875
10	11.415	11.545	11.587	11.70	2.762	1.755	11.597	.167	.133	6	.65	16.00	14.250	10.875	12.900	1.938	1.188	.875	12	1.000
12	13.456	13.606	13.648	13.76	3.064	2.396	13.656	.167	.133	6	.90	19.00	17.000	13.125	15.250	2.125	1.250	.875	12	1.000
14	15.672	15.875	16.125	16.26	4.085	3.885	16.136	.300	.160	5	1.13	21.00	18.750	15.375	16.938	2.250	1.375	1.000	12	1.125
16	16.091	16.315	16.365	16.50	4.383	3.983	16.376	.300	.160	5	1.25	23.50	21.250	17.625	19.125	2.500	1.437	1.000	16	1.125
18	20.346	20.594	20.643	20.78	4.780	3.948	20.656	.300	.160	5	1.39	25.00	22.75	20.041	21.500	2.830	1.563	1.125	16	1.250
20	22.605	22.875	22.925	23.06	5.113	4.313	22.936	.300	.160	5	1.56	27.50	25.00	21.906	23.750	2.830	1.688	1.125	20	1.250
24	27.140	27.435	27.505	27.64	5.846	5.045	27.516	.300	.160	5	1.68	32.00	29.50	26.994	28.125	3.830	1.875	1.250	20	1.375

ALL DIMENSIONS ARE IN INCHES. * MACHINING TOLERANCE TO BE ±.010" ** "L" DIMENSION IS LARGER THAN STANDARD.

FIG. 5

WHERE FARREL PROTECTS THIS SPEED REDUCER'S FUTURE


Precision ground shafts are designed to provide the rigidity necessary to prevent deflection and keep gears in exact alignment.
Herringbone gears—the famous Gear with a Backbone design — provide extra strength and load carrying capacity because the teeth are continuous across the face. Accurate generation of tooth contour and spacing, gradual engagement and oblique lines of contact assure correct tooth action and smooth, quiet operation.
Roller bearings of adequate size for the job hold the shafts in precise alignment.
Continuous splash lubrication supplies oil to gears and bearings. A trough system channels a continuous flow of oil to flood-lubricate the bearings. End covers and baffles at shafts prevent possibility of oil leakage, or entrance of dust and dirt.
Heavy section housing holds rotating elements in original alignment. Exterior ribbing at bearing points gives extra protection against deflection.
FARREL

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ROLLS: Chilled Iron, Dry Sand, Meehanite, Alloy Iron, Steel, Chromium Plated
FOR: Calender Stacks
Board Calenders
Super Calenders
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Smoothing Rolls
Coating Rolls
Creping Rolls
Plater Rolls
Cutting Rolls
Paraffining and Waxing Rolls
Saturating Rolls
Silicating Rolls
Miscellaneous Special Purposes
CALENDERS: Paper and Board
GRINDING MACHINES: Roll
CALIPERS: Roll
GEARS, CUT: Spur, Single and Double Helical (Farrel-Sykes Continuous Tooth Type)
SPEED REDUCING GEAR UNITS
SPEED INCREASING GEAR UNITS
FLEXIBLE COUPLINGS

To assure a longer future of smooth, efficient power transmission for this speed reducer, Farrel has designed in special protection at five vital places. This five-point protection gives additional vitality to withstand tough wear and preserves original power-transmitting ability for many extra years of trouble-free operation.

Farrel speed reducers are available in a wide range of sizes, with standard ratios of single reduction units from 1½:1 to 10:1, and double reduction units from 10:1 to 60:1. Write for further information about speed reducers or any of the other Farrel paper mill machinery listed on this page. FB-399

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston.

Farrel-Birmingham

IMPORTS

NEW YORK IMPORTS

WEEK ENDING JULY 12, 1947

SUMMARY

Newsprint ..... 12,910 rolls.
Printing Paper .... 20 cs., 650 rolls
Coated Paper ..... 47 cs.
Wafer Paper ..... 12 cs.
Filter Paper ..... 59 cs., 100 bls.
Wrapping Paper ..... 117 pkgs., 5 cs., 3305 rolls, 117 bls.
Wall Paper ..... 4 cs.
Drawing Paper ..... 14 cs.
Photo Paper ..... 53 cs.
Writing Paper ..... 27 cs.
Sulphite Paper ..... 220 rolls
Tissue Paper ..... 10 cs.
Gummed Paper .... 6 drums, 40 cs.
Tracing Cloth ..... 32 cs.
Drafting Paper ..... 2 cs.

NEWSPRINT

News Syndicate Co., Ted, Thorold, 171 rolls.
R. A. Olsen, Inc., G.D.D., Donnacona, 355 rolls.
News Syndicate Co., Mimi, Thorold, 1648 rolls.
(———), Newscarrier, Donnacona, 373 rolls.
R. A. Olsen, Inc., Kermic, Donnacona, 298 rolls.
N. Y. Sun, Hutchison I. Cone, Helsingfors, 254 rolls.
Bronx Home News, Hutchison I. Cone, Helsingfors, 184 rolls.
Il Progresso, Hutchison I. Cone, 366 rolls.
N. Y. Times, Hutchison I. Cone, Helsingfors, 1284 rolls.
N. Y. Herald Tribune, Hutchison I. Cone, Helsingfors, 262 rolls.
News Syndicate Co., Colabee, Baie Comeau, 7417 rolls.
H. G. Craig Co., A.C.D., Donnacona, 298 rolls.

PRINTING PAPER

News Day, Hutchison I. Cone, Helsingfors, 650 rolls.
Oxford University Press, American Importer, Liverpool, 20 cs.

COATED PAPER

F. P. Gaskell, American Importer, Glasgow, 47 cs. (for cigarette tips).

WAFER PAPER

Delft Packing & Trading Co., Ogelthorpe Victory, Rotterdam, 12 cs.

FILTER PAPER

Ste. Manheimer, Domfront, Bordeaux, 100 bls.
H. Reeve Angel & Co., Inc., Mauretania, Southampton, 25 cs.
H. Reeve Angel & Co., Inc., Vasconia, London, 34 cs.

WRAPPING PAPER

Clinton Paper Corp., Fort Amherst, St. Johns, 16 pkgs., 5 cs.
Jay Madden Corp., Hutchison I. Cone, Helsingfors, 2250 rolls.
E. W. Twitchell, Inc., Hutchison I. Cone, Helsingfors, 775 rolls.
Manufacturers Trust Co., Mormacmail, Gothenburg, 155 rolls.
Chemical Bank Trust Co., Mormacmail, Gothenburg, 125 rolls, 101 pkgs.
Public National Bank Trust Co., Mormacmail, Gothenburg, 117 bls.

WALLPAPER

Kersten Shipping Co., American Shipper, Havre, 1 cs.
All Transport, Inc., American Shipper, Havre, 1 cs.
Hudson Shipping Co., Oregon, Havre, 2 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Mauretania, Southampton, 1 cs.
Lansen Naeve Corp., Oregon, Havre, 13 cs.

PHOTO PAPER

American Express Co., Vasconia, London, 53 cs. (base paper).

WRITING PAPER

Globe Shipping Co., Mauretania, Southampton, 1 cs.
Gondrand Shipping Co., American Shipper, Havre, 20 cs.
Taub Hummel & Schnall, Oregon, Havre, 6 cs.

SULPHITE PAPER

F. P. Gaskell, Mormacmail, Gothenburg, 220 rolls.

TISSUE PAPER

O. Hommel Co., American Importer, Liverpool, 10 cs.

GUMMED PAPER

B. F. Drakenfeld & Co., Samtevoit, Liverpool, 4 cs. (not printed).
B. F. Drakenfeld & Co., American Importer, Liverpool, 36 cs., 6 drums (not printed).

TRACING CLOTH

E. Dietzgen & Co., Samtevoit, Liverpool, 12 cs. (bleached cotton).
E. Dietzgen & Co., American Forwarder, Manchester, 20 cs.

DRAFTING PAPER

D. C. Andrews & Co., American Importer, Liverpool, 2 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., American Victory, Leghorn, 77 bls. jute rags.
A. Bloch & Co., American Forwarder, Manchester, 78 bls. new cotton cuttings.
Irving Trust Co., American Forwarder, Manchester, 30 bls. colored cuttings.
Chase National Bank, Pioneer Star, Adelaide, 14 bls. dark cuttings, 13 bls. light cuttings.
Brandwein Mazur Co., Mount Rogers, Bombay, 200 bls. cotton waste.
A. W. Fenton Co., Mount Rogers, Naples, 134 bls. paperstock.
Ledeboer Co., American Importer, Liverpool, 70 bls. cotton waste.
J. A. Manning Paper Co., Vasconia, London, 35 bls. old colored cotton canvas.

OLD ROPE

W. Steck & Co., Excelsior, Calcutta, 193 bls. old hemp rope cuttings.

GLUESTOCK, ETC.

Transatlantic Animal By-Products Corp., American Forwarder, Liverpool, 177 bags hide cuttings.
Transatlantic Animal By-Products Corp., Vanderbilt Victory, Hong Kong, 100 bls. gluestock, 100 bls. hide glue.

CHINA CLAY

J. W. Higman, Titan, Fowey, 505 tons, 12 cwt.

BOSTON IMPORTS

WEEK ENDING JULY 12, 1947

International Purchasing Co., Pierre Victory, Antwerp, 63 bls. old manila rope.
(———), Mount Rogers, Alexandria, 6 bls. rags.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 12, 1947

Jay Madden Corp., Hutchison I. Cone, Helsingfors, 663 rolls wrapping paper.
National City Bank, Hutchison I. Cone, Kotka, 6495 bls. white moist mechanically ground woodpulp.
(———), Hutchison I. Cone, Kotka, 2720 bls. prime unbleached kraft sulphate pulp; 5700 bls. prime unbleached sulphite pulp.
Price & Pierce, Ltd., Mormacmail, Gothenburg, 750 bls. wet strong sulphite pulp.
E. W. Twitchell, Inc., Mormacmail, Gothenburg, 99 rolls sulphite paper.
Bank of N. Y. Trust Co., Durango Victory, Rotterdam, 42 bls. old blue cotton rags.
Elof Hansson, Inc., Cristallina, Utansjoe, 19,800 bales unbleached sulphite.
Elof Hansson, Inc., Cristallina, Sandviken, 6000 bales unbleached kraft pulp.

BALTIMORE IMPORTS

WEEK ENDING JULY 12, 1947

S. Shapiro & Sons, Ogelthorpe Victory, 4 bls. old rags
Gottesman & Co., Mormacmail, Gothenburg, 4064 bls. dry sulphate pulp; 375 bls. sulphite pulp.
Elof Hansson, Inc., Mormacmail, Gothenburg, 1000 bls. prime easy bleaching sulphite pulp.
Mead Sales Co., Mormacmail, Gothenburg, 2500 bls. sulphite pulp.
National City Bank, Mormacmail, Gothenburg, 258 rolls newsprint.
Elof Hansson, Inc., Mormacmail, Stockholm, 1000 bales unbleached sulphite.
Elof Hansson, Inc., Mormacmail, Gothenburg, 258 rolls white newsprint.

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It's the *complete* Crane line that saves time in writing specifications . . . in ordering materials . . . and on the installation. It's the line that simplifies piping procedures from design to erection to maintenance. Because it permits standardization on the widest scale . . . and because standardizing on Crane equipment gives you this 3-way advantage:

ONE SOURCE OF SUPPLY offering the world's most complete selection of valves, fittings, pipe, accessories and fabricated piping for all power, process, and general applications.

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Branches and Wholesalers Serving All Industrial Areas

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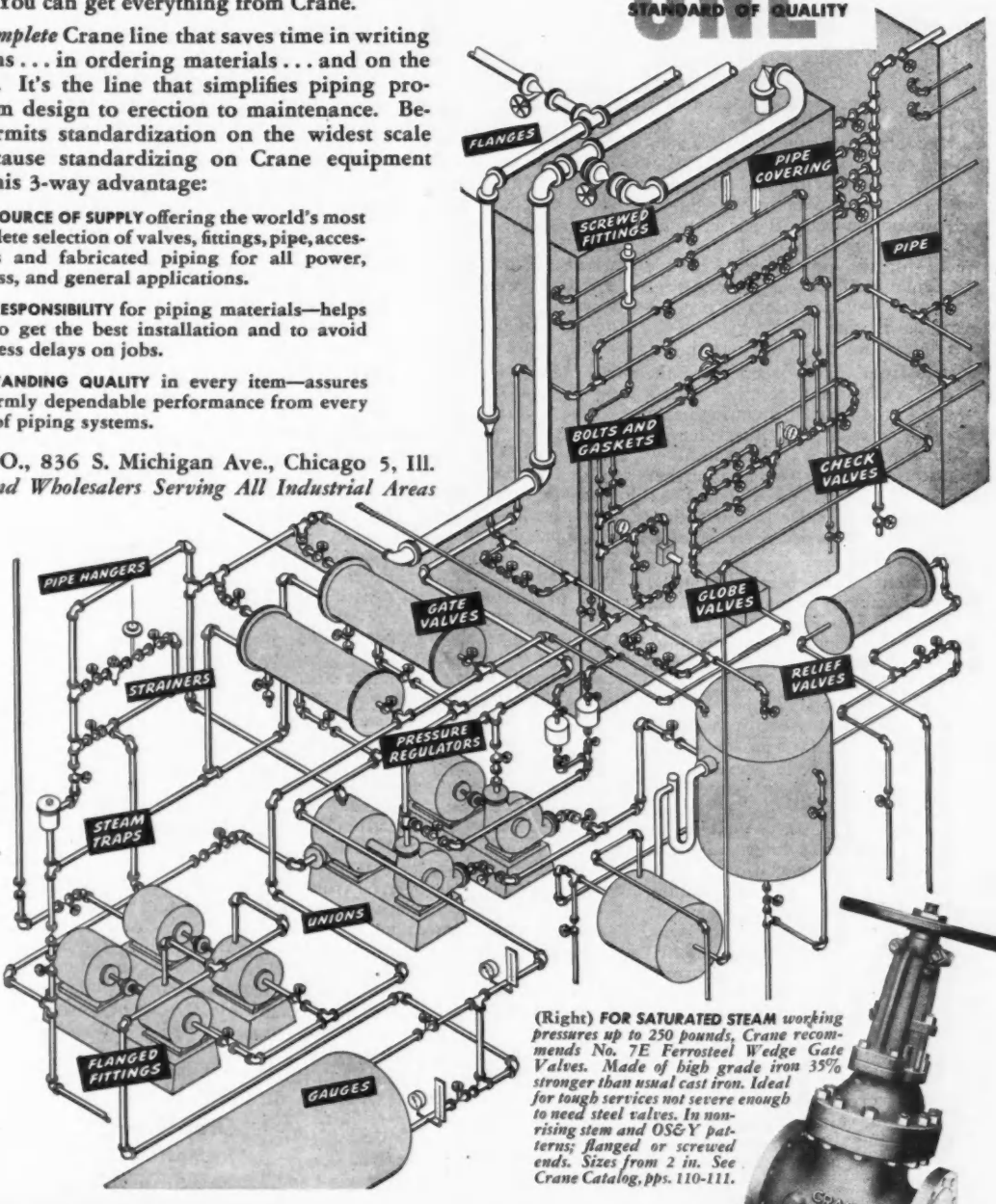
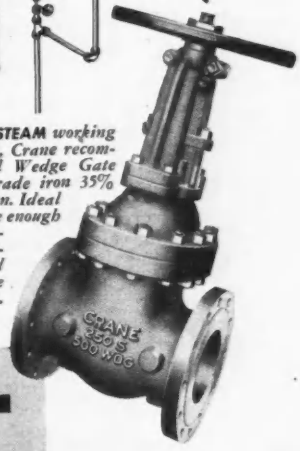


Fuel, water and condensate piping to oil-burning boilers.



(Right) **FOR SATURATED STEAM** *working pressures up to 250 pounds, Crane recommends No. 7E Ferrosteel Wedge Gate Valves. Made of high grade iron 35% stronger than usual cast iron. Ideal for tough services not severe enough to need steel valves. In non-rising stem and OS&Y patterns; flanged or screwed ends. Sizes from 2 in. See Crane Catalog, pps. 110-111.*

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VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, July 16, 1947.

The ratio of United States production to mill capacity for the week ending July 5, 1947, as reported by the American Paper and Pulp Association was 60.3 per cent compared with a revised figure of 103.7 per cent for the preceding week and 61.1 per cent for the corresponding week a year ago. This does not include mills producing newsprint exclusively. Paperboard production was 78 per cent for the current week compared with 102 per cent for the preceding week and 70 per cent for the corresponding week a year ago. The drop in the production ratios is due to the fourth of July holiday and vacation period.

Reports from various sections of the Mohawk Valley reflect the steady growth of the paper manufacturing industry. New additions either planned or under way in some places will allow more manufacturing space and further enlargement of forces. A trend toward higher wage scales is also noticeable and many mills have signed new contracts recently.

Negotiations have been completed at the Mechanicville plant of the West Virginia Pulp & Paper Co. under which the 1,200 employes will receive an increase in wages ranging from 4 to 11 cents hourly. The increase is the second negotiated by labor leaders since V-J Day and went into effect during the past week. The latest advance differs from those previous because it is granted on a percentage basis rather than a flat boost. Wage increases since V-J Day total from 34½ cents to 41 cents hourly. It was stated that the advance conforms with the company policy of maintaining rates in line with those throughout the industry. The latest increase will amount to about $175,000 annually, bringing the hourly payroll to approximately $3,250,000 yearly. The basic hourly rate is now $1.04 under the latest boost.

Several hundred employes of the Union Bag & Paper Company, Hudson Falls, received substantial wage increases as the result of negotiations completed during the past week. Male employes with a basic wage of one dollar per hour will receive a boost of 13 cents per hour while the pay of female workers is raised seven cents hourly under the new contract. The boosts are retroactive to June 1. John P. Burke, president and secretary of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, was assisted in the negotiations by Joseph Tonelli, vice president of the local. Donald Hardenbrook, vice president of the Union Bag & Paper Co., represented the management with P. Fay Marrs and True M. Avery, both officials of the firm.

Reports gathered together by reporters including staff members of the Chicago Journal of Commerce, indicate that the current peak output of containers is expected to ease the shortage in this field by the end of 1948. The conclusion is based on a survey of industry authorities. These surveys show that a plentiful supply of paperboard "may" show up after the end of 1947 with paperboard containers, which absorbed 4,300,000 tons of the 8,450,000 produced last year, expected to be materially benefited by the 1947 production rate. Output of paperboard is now quoted by the National Paperboard Association as running currently about 12 percent higher than in 1946.

The reports clearly indicate that containers now are a major industry with an annual output set at $2,000,000,000 by the New York Trust Company. The industry is expected to grow, rather than retract. A great number of new developments have taken place in the container field itself and, according to Walton D. Lunch, until recently president of the Packaging Institute, the spread of the market has put a tremendous emphasis on packaging design which should increase usage. New innovations in construction are also expected to aid in reducing production costs which development is also expected to expand the usage of containers in many new fields.

Paper and pulp output still failed to satisfy the hungry demand in the Chicago area. Paperboard mills also were still unable to satisfy orders. Locally, it was indicated that promised new production to be derived from new construction and modernization had been materially slowed up because of materials bottle necks, high costs of construction and for myriads of other reasons. Local trade executives expect no readjustment in the current strong position for many months to come.

Meanwhile, the midwestern waste paper market continued dull, with trading of little consequence, because of the vacations in the mills. Large accumulations of mixed papers were reported. The market for No. 1 mixed was quoted as remaining at nominally $12 a ton, delivered to mills, but there were indications that dealers were willing to sell at lower prices because of clogged up holdings. No. 1 news was quoted locally as remaining at $20 a ton, while No. 1 corrugated was in a stronger position, getting $30. The market was expected to strengthen in the very near future as some mills were already resuming operations and others were expected to get going at full schedule during the next week or ten days.

Supplies of soda ash, caustic soda, and salt cake were listed by the Department of Commerce on June 27, as still short of consumer requirements, based on March production figures.

Wholesale sales of paper and paper products for the first five months of 1947 were $47,544,000, a gain of 24 percent over the corresponding 1946 months, according to the Bureau of Census, based on figures from 70 reporting firms.

May sales of the group showed $9,028,000, three percent under those of April, but 11 percent above May a year ago.

Inventories shown by 35 reporting firms gained 4 percent in May over April, and were 33 percent above those in May a year ago.

Cash Register Buys Plant At Mechanicville

ALBANY, N. Y.—Establishment of a new branch factory at Mechanicville by the National Cash Register Co. will eliminate shipment of tons of paper over hundreds of miles, according to announcement. The company has acquired title to a large building in that village which is to be remodeled and utilized as a paper-slitting factory. Announcement is made that the new branch will probably be in operation before the first of January and will furnish employment to about thirty persons.

Wisconsin Reservoirs Net One Per Cent Loss

WAUSAU, Wis. — Reservoirs of the Wisconsin Valley Improvement Company showed a loss of 161,000,000 cubic feet of water reserves during the week ending July 6. The reservoirs were filled to somewhat over 91 percent of capacity on June 29 and dropped to 90.18 percent during the week. Total reserves on July 6 were 15,347,000,000 cubic feet as compared to 15,965,000,000 on the same day last year, and 16,000,000,000 on the same date in 1945.

Drop Export Controls On Insulation and Wallboard

WASHINGTON—Export controls were dropped from fiber insulation board, and wallboard made from paper or pulp, effective July 11, the Office of International Trade has announced.

According to the most recent estimates production has increased and housing needs are being met. There are indications of a surplus available for export, it was said. However, plaster board and wallboard made of gypsum remain under export control.

the name to know is

CAMACHINE

For dependable, high-speed roll-winding machines of any capacity—for top performance on any type of paper or paperboard—to meet any mill or converting plant requirement—*the name to know is* CAMACHINE.

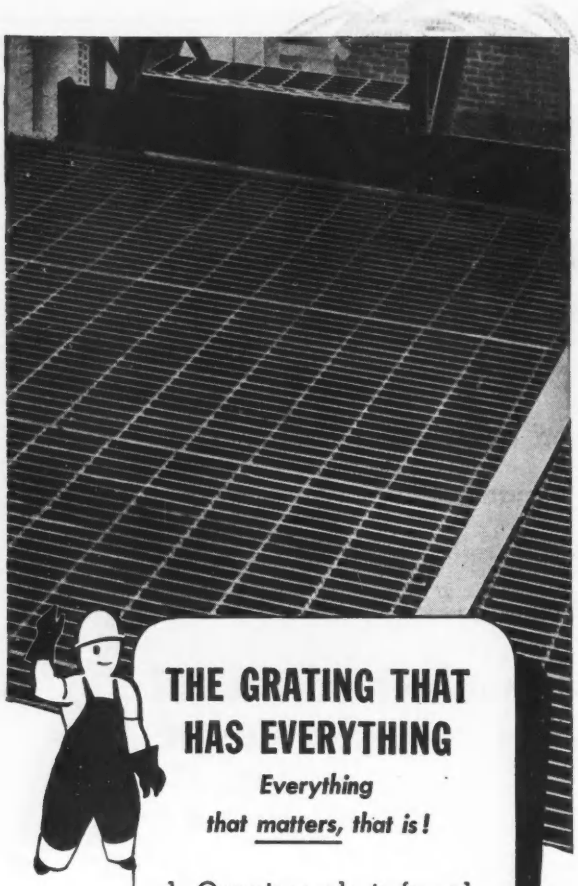
CAMERON MACHINE COMPANY

61 POPLAR STREET, BROOKLYN 2, N. Y.

MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO 3, ILL.

CAMACHINE 20

For newsprint book and kraft. Web widths 180" to 310". Speeds up to 4000 fpm.



THE GRATING THAT HAS EVERYTHING

Everything that matters, that is!

1. One-piece electroforged steel construction for guaranteed strength!
2. Easy maintenance—paint reaches entire surface!
3. Maximum open area for light and air!
4. Self-cleaning—no sharp corners to clog with dirt!
5. Economical and easy to install—wherever and whatever your grating needs!

For a "close-up" of Blaw-Knox Grating construction, write today, on your business letterhead, for this "paper-weight-size sample".

BLAW-KNOX DIVISION
of Blaw-Knox Company
2119 Farmers Bank Bldg., Pittsburgh 22, Pa.

BLAW-KNOX
ELECTROFORGED STEEL GRATING

MARKETS

BLANC FIXE—Supplies adequate to meet steady demand, deliveries fair. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lot same basis.

BLEACHING POWDER—Supplies tight although paper mill demand has eased up. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3.00 to $3.75 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Market continues tight, relief expected as new production arrives. Solid caustic soda is reported at $2.50 to $2.75 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds, car lots, at works.

CHINA CLAY—Heavy demand continues, supply tight. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE—Strong demand continues in a tight market. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2 to $3.50 per 100 pounds.

ROSIN—Gum Rosin in drums per 100 pounds, net, in yard New York, car lots, B, D, E, $8.85; F, G, H, I, K, M, $9.01; N, $9.05; WG, $9.06; WW, $9.25. Wood Rosin per 100 pounds, l.c.l., f.o.b. N. Y., B, $6.95; FF, $8.20; G, H, I, $8.35; WG, $8.65; WW, $8.81; X, $8.91.

SALT CAKE—Demand continues to increase as supply shows little improvement. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26 per ton in bulk. Chrome salt cake is quoted at $20 to $26 per ton.

SODA ASH—Demand active as supplies continue short, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.08; in paper bags, $1.20; and in barrels, $1.60.

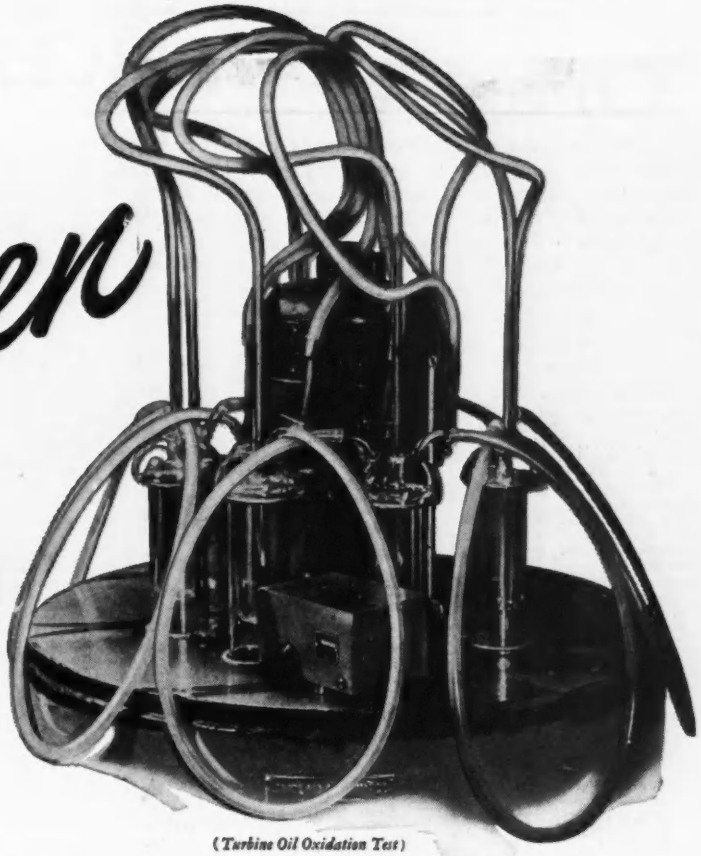
STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $5.57 per 100 pounds; powdered starch at $5.68 per 100 pounds, car lots, Chicago.

SULPHATE OF ALUMINA—Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds, in bags at works.

SULPHUR—Plentiful supplies to meet active domestic and export demands. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines: Canadian at $35 to $45 per ton. All prices in car lots.

Oxygen ...FRIEND OR FOE?



(Turbine Oil Oxidation Test)

Without oxygen, man cannot live. Yet, reaction to oxygen may shorten the service life and destroy the value of a lubricant!

Sinclair is ever alert to the importance of knowing exactly how oils will resist oxidation which can form gums and sludge detrimental to equipment performance.

No satisfactory, quick, short time oxidation test methods have yet been developed. Sinclair Research does not compromise. Some studies require continuous tests of 1000 hours. Others, performed with the apparatus above, are run for 100 hours or more.

This test — to assure consumers that breakdown and resultant costly repairs due to oxidation will be at a minimum — constitutes one safeguard against inferior product performance . . . just as all Sinclair Research is your assurance that every Sinclair Industrial Lubricant is the very highest in quality.

Sinclair Power Plant Oils

For Turbines:

SINTURLITE OILS

Oxidation stability, rust prevention, long life

For Compressors:

RUBILENE OILS

In grades to suit all operating conditions

From selected crude processed to quality finish

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SINCLAIR

Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—
Roll, contract ....$90.00 to —
Sheets .....$109.00 " —

Kraft—per cwt.—Carload Quantities
Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.35	to	1.65
Wh. No. 1 M. G.	1.35	"	1.65
Wh. No. 1½	1.20	"	1.45
Wh. No. 2	1.30	"	1.55
Wh. Anti-Tar	2.75	"	4.25
Kraft Unbl.	1.45	"	1.85
Manila No. 2	1.25	"	1.45

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	4.47	to	5.50
Bleached	6.50	"	—

Paper Towels—Per Case of 3750—Zone 1.

Wh. C. fold 11x13½	4.39	to	4.80
Br. Sgl. fold 10 in.	2.67	"	3.00
Br. M'tif'd 9½x14¾	3.78	"	4.15
Br. M'tif'd 9½x9¾	2.67	"	3.00

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	to	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mla. L1 Chip*	102.50	"	—
White Pat. Coated*	120.00	"	—
Kraft Liners 42 lb.	95.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2 50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$50.00	$48.00
100% Rag	46.50	43.00	41.25
75% Rag	35.00	32.50	31.50
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext. No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—
White, Assorted Items
Bonds, per cwt.

No. 1	$18.75	$16.25	$15.50
No. 2	17.00	15.25	14.50
No. 4	16.00	14.50	14.00

Ledgers, per cwt.

No. 1	$17.00	$17.00	$16.35
No. 2	17.75	16.25	15.50
No. 4	17.00	15.00	14.25

Free Sheet Book Papers—
White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$19.40	$18.60
No. 2 Glossy Coated	18.15	17.35
No. 3 Glossy Coated	17.65	17.00
No. 1 Antique (Water marked)	$14.90	$14.25
No. 2 Offset	15.35	14.70
A Grade E. F.	13.90	13.30
A Grade S. & S. C.	14.40	13.70
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	
C Grade E. F.	Nominal	
C Grade S. C.	Nominal	
D Grade E. F.	Nominal	
D Grade S. & S. C.	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to $80.00
Unbleached Sulphite	115.00 " 117.00
Bleached Sulphite	121.00 " 125.00
Bleached Soda	115.00 " 120.00
Unbleached Kraft	112.50 " 120.00
Southern Kraft	90.00 " 102.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short ADT
Select Unbleached Kraft (no freight allowance)	115.00 " —
Unbleached Sulphite	115.00 " 117.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " 80.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Kraft	$150.00 to 156.00
Bleached Sulphite	151.00 " 158.50
Unbleached Sulphite	121.00 " 131.00
Unbleached Kraft	116.00 " 126.00

Finnish Quotations
Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50 to	$12.00
Light Silesias	7.50	
Unbleached Muslin	11.50 "	12.00
White Back Blue Overalls	8.25	
Blue Overalls	7.75	
Unbl. Fancy Shirt	4.50 "	5.00
Light Percales	5.50 "	6.00
Light Prints	5.25 "	5.95
Washables	4.00	
Bleachable Khaki	5.50 "	6.00
Unbleachable Khaki	5.00 "	5.50
Cottonades	4.50 "	5.00

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.00
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	2.20
No. 2 Roofing Rags	2.10
No. 3 Jute Bagging	2.00
No. 4 Brussels and hard back carpets	2.00
No. 5A Roofing Rags	2.00

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to —
New Mixed Cuttings	6.50 " —
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	3.00 " 3.75
Dark Cottons	2.50 " 3.00
Old Shopperies	2.50 " 3.00
New Shopperies	2.50 " 3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " 6.50
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	5.50 " 6.00
Mixed Strings	1.75 " 2.50

Waste Paper

Prices to Mills
(Dollars Per Ton)
f.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$120.00
No. 1 Hard White Envelope Cuts	90.00	"	100.00
No. 1 Hard White Shavings, unruled	100.00	"	110.00
No. 1 Hard White Shavings, ruled	80.00	"	90.00
Soft White Shavings, one cut	95.00	"	105.00
No. 1 Soft White Shavings	85.00	"	95.00
Soft White Shavings, Misc.	65.00	"	75.00
No. 1 Fly Leaf Shavings	55.00	"	60.00
No. 2 Fly Leaf Shavings	50.00	"	55.00
No. 1 Groundwood Fly Leaf Shavings	30.00	"	33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	30.00	"	37.50
Mixed Books	15.00	"	20.00
No. 1 White Ledger	60.00	"	65.00
New Manila Envelope Cuttings, one cut	100.00	"	110.00
New Manila Envelope Cuttings	65.00	"	75.00
Extra Manilas	35.00	"	40.00
Mixed Kraft, Env. & Bag Cuttings	75.00	"	85.00
Kraft Envelope Cuttings	100.00	"	105.00
Triple Sorted, No. 1 Brown Soft Kraft	60.00	"	70.00
New 100% Kraft Corrugated Cuttings	60.00	"	70.00
No. 1 Assorted Old Kraft	40.00	"	50.00
New Jute Corrugated Cuttings	27.00	"	—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	19.00	"	20.00
No. 1 Mixed Paper	17.00	"	19.00
Box Board Cuttings	20.00	"	—
White Blank News	75.00	"	80.00
Overissue News	(nominal)		
Old Corrugated	28.00	"	30.00
Mill Wrappers	22.00	"	25.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—			
Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.10½	@	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.05½	"	.06
Bleachable Cotton Cuttings	.06½	"	.07
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	@	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—			
Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—			
Foreign No. 1	nominal		
Domestic No. 1	2.00	"	2.05
Domestic No. 2	1.90	"	1.95
Roofing Bagging	1.90	"	1.95
Old Manila Rope	5.75	"	6.00

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	nominal		
Domestic	4.25	@	4.50
No. 1 Clean Bright—Sisal Strings	.04	"	.04½
No. 2 Clean Bright—Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.85

Bristol's Model 40M Liquid Level Recording Gauge—also available for flush-panel mounting.

DEPTH OF ANY LIQUID

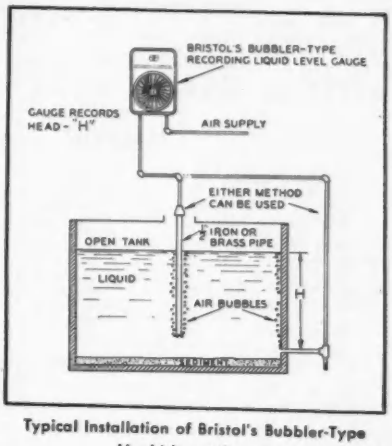
Automatically measured and recorded

Bristol's Liquid Level Gauges accurately show and keep a permanent record of the level of any liquid — in open or closed vessels.

Float, pressure-bulb, pressure, air-bubbler, and differential type liquid level gauges are offered in all ranges of application.

Automatic Controllers in both electric and air-operated models are also available.

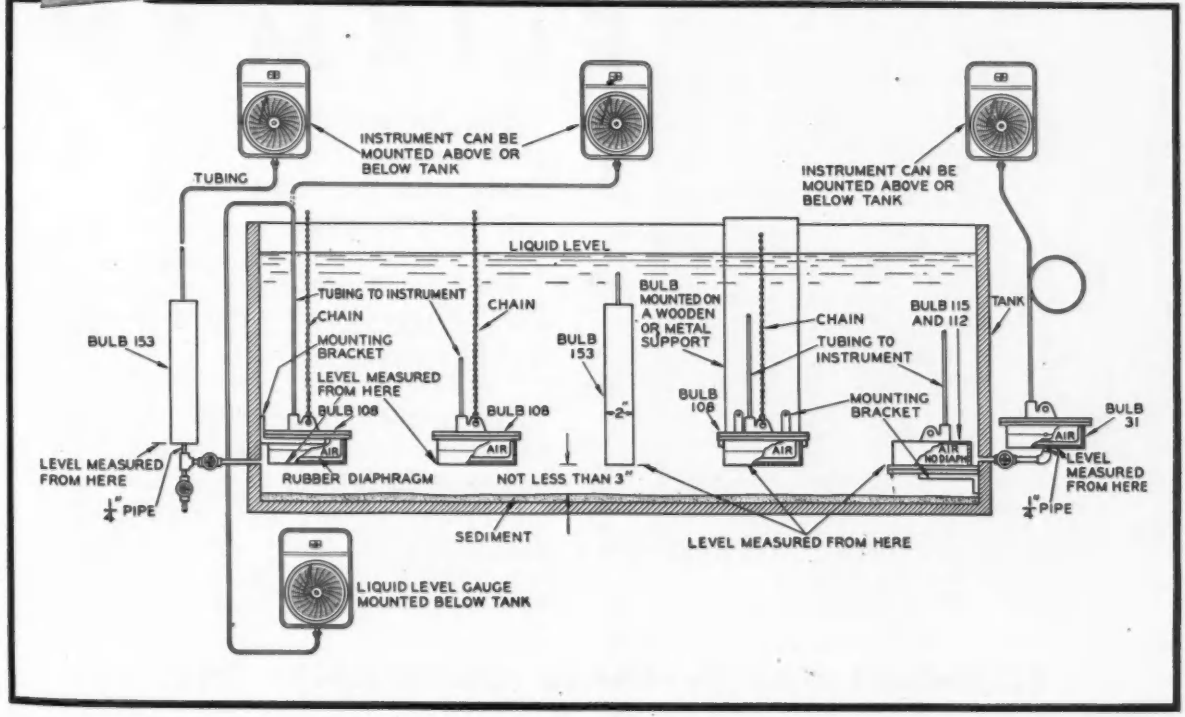
The diagrams show typical methods of installing liquid level gauges. Further information on Bristol Liquid Level Gauges is given in Bulletin L700. Address The Bristol Company, 148 Bristol Road, Waterbury 91, Conn. U.S.A. The Bristol Company of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Ltd., London N.W.10, England.



Typical Installation of Bristol's Bubbler-Type Liquid Level Gauge

BRISTOL

Engineers process control for better products and profits



AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS

Wool Tares, heavy	4.00	"	4.25
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	75.00	"	80.00
Ledger, colored	60.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	45.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	20.00	"	—
Box Board Cuttings	20.00	"	—
Kraft Corrugated Cuttings	nominal		
Old Corrugated	30.00	"	35.00
Overissue News	40.00	"	—
No. 1 News	—	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	@	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.08	@	—
Fancy Percales	.07½	"	.08
New White No. 1	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06½	"	.06½
B. V. D. Cuttings	.10½	"	.11½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues,			
Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

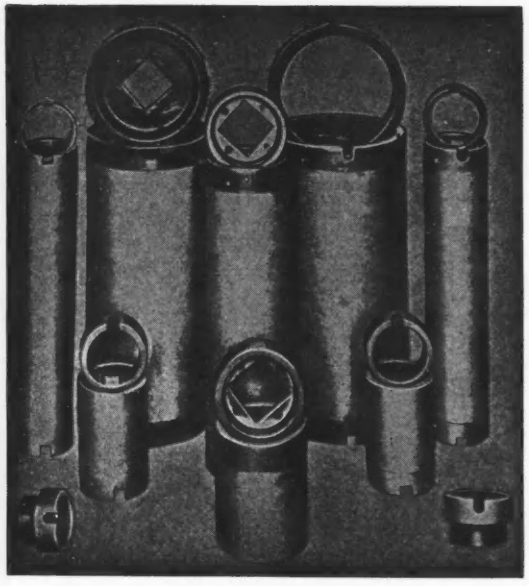
Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	20.00	"	—
No. 1 Mixed Paper	12.00	"	—
Old Corrugated	30.00	"	—
Mill Wrappers	22.00	"	—



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United States Patents on Papermaking

Second Quarter, 1947

Compiled by Clarence J. West, Chairman, Committee on Bibliography, TAPPI.

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Because, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; also, it is possible that the list may contain some patents that do not apply specifically to pulp and paper manufacture.

Copies of any of the following patents can be obtained from the United States Patent Office, Washington 25, D. C., by sending twenty-five cents for each patent desired.

April 1, 1947

2,418,135. Bituminous adhesive. Samuel A. Moore and Theodore Greenfield, assignors to Interchemical Corporation, New York, N. Y. Filed June 9, 1943. 4 claims. (Cl. 260-28). The adhesive contains petroleum naphtha, blown asphalt, hard stearin pitch, and a resin.

2,418,167. Recovery of SO_2 from digester blowoff gases. Horace A. Du Bois, assignor to Paper Patents Company, Neenah, Wis. Filed Oct. 5, 1940. 4 claims. (Cl. 92-11). The sulphur dioxide is absorbed into water and then stripped from the solution by contact with hot burner gases.

2,418,215. Woven fibre rug. Ernest E. Lambert, assignor to Patchogue-Plymouth Mills Corporation, New York, N. Y. Filed Jan. 4, 1946. 11 claims. (Cl. 139-420). A method of forming a woven rug of paper fiber threads of different colors.

2,418,248. Molded fibrous pulp container having closure securing means. Harvey R. Denton, assignor to Moist-R-Proof Container Co., San Francisco, Calif. Filed March 31, 1944. 3 claims. (Cl. 229-45).

2,418,293. Processing thermoplastic resins from cellulose and rosin acids. Eduard Farber, New Haven, Conn., assignor to Polyxor Chemical Co., Inc. Filed Dec. 6, 1943. 3 claims. (Cl. 260-9). A cellulose-containing material is heated with the resin acids of tall oil, the resin and fatty acids of tall oil, or rosin at 160° to 220° C. for from 2 to 30 minutes.

2,418,303. Laminated photographic material and process for producing the same. Miller R. Hutchison, assignor to Ralph G. Luff, Philadelphia, Pa. Filed Oct. 24, 1941. 14 claims. (Cl. 95-8). A continuation of U. S. patent 2,311,547 (Feb. 16, 1943); a paper base coated with a photographic emulsion is laminated to a metal or glass plate.

2,418,304. Adhesive photosensitive material. Miller R. Hutchison, assignor to Ralph G. Luff, Philadelphia, Pa. Filed Dec. 22, 1943. 2 claims. (Cl. 95-8). A paper base carrying a sensitive emulsion is applied to a metal-backing by means of a heat-set adhesive.

2,418,311. Process of treating chick-hatchery waste to recover protein-fat concentrates. William D. McFarlane and Nikollai Nikolaiczuk, assignors to The Ogilvie Flour Mills Co. Limited, Montreal, Canada. Filed March 26, 1945. 6 claims. (Cl. 99-2). The waste material is subjected to the action of lignin in the presence of heat.

2,418,350. Carrier for bottles and the like. Mitchel E. Holy, assignor to Container Corporation of America, Chicago, Ill. Filed Aug. 21, 1941. 5 claims. (Cl. 229-52). A collapsible carrier.

2,418,353. Process of making closure caps. William J. Keith, assignor to Keith-Peabody, Inc., Brookline, Mass. Filed Oct. 13, 1943. 6 claims. (Cl. 93-36). A paper cap has two wall portions.

2,418,354. Dielectric sheet material. Edward A. Kern and Harry F. Miller, assignors to General Electric Company, Schenectady, N. Y. Filed Nov. 26, 1943. 4 claims. (Cl. 117-155). The dielectric material consists of paper containing about 20% by weight of barium strontium titanate and coated with a resinous material.

2,418,367. Container and closure therefor. Joseph Pulvers, Brooklyn, N. Y. Filed June 9, 1944. 1 claim. (Cl. 229-5.7).

2,418,371. Suction cleaner. Donald G. Smellie, assignor to The Hoover Company, North Canton, Ohio. Filed April 8, 1943 8 claims. (Cl. 229-53). The bag for a suction cleaner is made of paper.

April 8, 1947

2,418,525. Manufacture of water-resistant uninflammable organic fibrous materials and product. Frederick F. Pollak, Brooklyn, N. Y. Filed Sept. 29, 1942. 6 claims. (Cl. 117-137). A product is rendered uninflammable, water resistant, and mildew-proof by treatment with an aqueous solution containing pyrophosphoric acid and melamine and drying at 120° to 140° C.

2,418,547. Method and apparatus for defibering paper stock. Edwin Cowles, assignor to The Cowles Company, Princeton, N. J. Filed March 17, 1943. 8 claims. (Cl. 92-26). A modification of U. S. patent 2,265,936 (Dec. 9, 1941). The importance of maintaining a vortex having a hollow core extending downward from the surface of the stock to the impeller is stressed.

2,418,551. Hollow article and method of making the same. Lillian L. Greneker, New York, N. Y. Filed May 19, 1945. 5 claims. (Cl. 154-118). A method of making hollow articles, such an manikins.

2,418,600. Method and machine for forming paper. Harry M. Ostertag and Francis O. Boylan, assignors to Scott Paper Company, Chester, Pa. Filed Feb. 1, 1944. 16 claims. (Cl. 92-44). The machine comprises essentially a traveling forming wire and a breast roll about which the wire is trained in the conventional maner.

2,418,706. Doctor mechanism for paper-making rolls and cylinders. Francis H. Goyette, assignor to Lodding Engineering Corporation, Worcester, Mass. Filed Dec. 3, 1943. 2 claims. (Cl. 92-74). A holder for the Lodding doctor blade is constructed to compensate for the wear of the blade.

2,418,726. Log handling apparatus. Robert S. Rogers, Jr., Sheraw, S. C. Filed Jan. 16, 1945. 15 claims. (Cl. 214-83). A method of loading logs onto a truck.

April 15, 1947

2,418,843. Fire-resistant coating composition. Martin Leatherman, Hyattsville, Md. Filed June 30, 1945. 2 claims. (Cl. 260-32). The formula for rot-and fireproofing fabrics contains 20 lb. polyvinyl chloride, 8 lb. zinc carbonate, 8 lb. tricresyl phosphate, 7 lb. triphenyl phosphate, 45 lb. acetone, 7 lb. inert pigment, 0.8 lb. zinc naphthenate, and 0.5 lb. pentachlorophenol.

2,418,900. Method of and apparatus for making cups. Rene P. Piperoux and Dimitri G. Soussloff, assignors to Celanese Corporation of America, New York, N. Y. Filed May 19, 1943. 19 claims. (Cl. 93-36).

2,418,963. Reinforced receptacle. Wilbur G. Anderson, Jr., assignor to American Box Board Company, Grand Rapids, Mich. Filed April 9, 1945. 4 claims. (Cl. 229-37).

2,418,973. Thickener. Harlowe Hardinge, assignor to Hardinge Company, Inc., York, Pa. Filed Feb. 18, 1942. 5 claims. (Cl. 210-55).

2,418,975. Valve closure flap. Harold M. Johnson, Toledo, Ohio. Filed Oct. 5, 1944. 1 claim. (Cl. 229-62.5). A valve bag having an intake valve of foldable collapsible type.

2,418,981. Method of producing tanning materials from waste sulphite liquor. Oskar A. Müller, Zurich, Switzerland. Filed Dec. 16, 1943. 3 claims. (Cl. 260-124). Sulphite waste liquor is treated with chlorine in an amount of 10 to 30% of the dry content of organic material present and the chlorinated material is hydrolyzed with an alkaline hydroxide.

2,419,080. Method of coating with alkali silicate. Charles E. Krause, Sparks, Md. Filed July 28, 1942. 3 claims. (Cl. 117-46). A coating composition for concrete and the like consists of a mixture of an alkali silicate and lignin.

2,419,155. Wood pulp screen plate. Samuel T. Orton, Jr., assignor to Union Screen Plate Company, Fitchburg, Mass. Filed Feb. 10, 1944. 1 claim. (Cl. 92-30).

2,419,182. Dispensing carton. William J. Wells, assignor to F. N. Burt Company, Inc., Buffalo, N. Y. Filed July 10, 1943. 4 claims. (Cl. 222-561). A dispensing closure for a carton.

April 22, 1947

2,419,206. Control of gloss in printing. Harry C. Fisher, assignor to Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis. Filed Aug. 8, 1941. 12 claims. (Cl. 117-60). The surface of the web is treated with a water wetting and penetrating agent, the coating is applied in an aqueous vehicle, and the product is dried.

2,419,207. Method of production of coated board and paper. Harry C. Fisher, assignor to Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis. Filed Sept. 4, 1943. 24 claims. (Cl. 117-60). The web is treated with an aqueous polyvinyl alcohol, the treated web is passed through rolls to smooth the surface, and the dampened web is coated with a mineral in an aqueous vehicle, dried, and calendered.

2,419,211. Tall oil treatment. George C.

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HYCAR latex, when used as an impregnant for even inexpensive papers, imparts to the papers many desirable properties not readily obtainable with other impregnants.

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Harris, assignor to Hercules Powder Company, Wilmington, Del. Filed May 25, 1945. 9 claims. (Cl. 260-97.5). Tall oil is dissolved in an organic solvent (acetone, isopropyl alcohol, naphtha, or gasoline) and the resin acids are precipitated with a primary amine, such as cyclohexylamine.

2,419,341. Dissolving cellulose. Sidney M. Edelstein, Elizabeth, N. J. Filed Dec. 13, 1943. 5 claims. (Cl. 260-212). Cellulose is treated with an alkali metal hydroxide containing dissolved alkali metal zincate.

2,419,391. Corner fastening means for paperboard boxes, cartons, and the like. Jay D. Crary, assignor to Paper Strap, Inc., Portland, Oreg. Filed May 12, 1944. 1 claim. (Cl. 229-35).

2,419,510. Hinged cover triangular carton. Robert Van Rosen, assignor to J. Makowsky Corporation, New York, N. Y. Filed June 6, 1945. 9 claims. (Cl. 229-22).

April 29, 1947

2,419,616. Container. Richard J. White, assignor to American Can Company, New York, N. Y. Filed Nov. 30, 1944. 4 claims. (Cl. 229-5.7).

2,419,646. Container. William H. Inman, assignor to Bloomer Bros. Company, Newark, N. Y. Filed Dec. 9, 1944. 5 claims. (Cl. 229-31).

2,419,783. Ester derivatives of lignin sulphonates. Kermit Longley, assignor to Quaker Chemical Products Corp., Conshohocken, Pa. Filed Jan. 31, 1944. 2 claims. (Cl. 260-124). A higher fatty acid ester of a lignosulphonate is claimed.

2,419,842. Handle accessory for containers. Samuel N. Lebold, assignor to Morris Paper Mills, Chicago, Ill. Filed March 5, 1945. 6 claims. (Cl. 224-45).

2,419,896. Dentifrice applicator. Rudolph G. Hobelmann, assignor to The Davidson Chemical Corporation, Baltimore, Md. Filed March 27, 1944. 3 claims. (Cl. 15-227). A paper thimble for applying dentifrice.

2,419,918. Decalcomania. Henry F. Scheetz, Jr., Pittsburgh, Pa. Filed June 15, 1945. 6 claims. (Cl. 41-33).

May 6, 1947

2,419,945. Froth flotation of silica from iron ore. Julius B. Clemmer and Milton F. Williams, Jr., Tuscaloosa, Ala. Filed Dec. 11, 1944. 6 claims. (Cl. 209-16). Tall oil or tall oil soap is employed.

2,419,951. Sealing compound applying apparatus. Ferdinand Kastel, assignor to Continental Can Company, Inc., New York, N. Y. Filed March 3, 1945. 18 claims. (Cl. 91-43).

2,419,971. Padding and soundproofing material. Herman Rumpf and Irwin J. Rumpf, Burlingame, Calif. Filed June 5, 1943. 3 claims. (Cl. 154-44). A corrugated product.

2,419,991. Method and apparatus for sealing cartons by suction. Robert M. Dunning, assignor to Waldorf Paper Products Company, St. Paul, Minn. Filed Jan. 4, 1945. 14 claims. (Cl. 93-6).

2,420,119. Method and apparatus for bending sheet material. Robert M. Boehm and Aaron A. Ladon, assignors to Masonite Corporation, Laurel, Miss. Filed Nov. 29, 1944. 11 claims. (Cl. 18-19). A mold for bending hard boards.

2,420,144. Scale resistant concrete and cement. Jacob G. Mark, assignor to Dewey and Almy Chemical Company, North Cambridge, Mass. Filed Feb. 18, 1942. 10 claims. (Cl. 106-94). The concrete contains not more than 0.05% of tall oil, by weight on the cement.

2,420,212. Bag. Hans Volksdorf, assignor to Thomas M. Royal & Co., Philadelphia, Pa. Filed April 1, 1946. 12 claims. (Cl. 229-55).

May 13, 1947

2,420,336. Method of design formation on colored paper. Herman C. Orchard, assignor to Orchard Paper Company, St. Louis, Mo. Filed April 28, 1945. 3 claims. (Cl. 8-7). A colored paper is printed on one side with a paste containing a bleaching agent (sodium chlorite or a mixture of chlorite and hypochlorite) which bleaches a design on the paper.

2,420,366. Adhesive tape and method of use in plywood. Henry C. Green, assignor to Haskelite Manufacturing Corporation, Grand Rapids, Mich. Filed Feb. 19, 1943. 7 claims. (Cl. 117-122). An adhesive paper tape is used to secure the margins of a wood veneer or a split therein.

2,420,460. Carton divider. Fairbanks C. Bowdoin and Homer L. Medlock, Phoenix, Ariz. Filed Feb. 1, 1945. 1 claim. (Cl. 164-73). A severing tool for sheets and cartons.

May 20, 1947

2,420,642. Treating machine for opening hinged closure members on containers. August E. Almgren ,assignor toAmerican Can Company, New York, N. Y. Filed July 19, 1944. 7 claims. (Cl. 226-129).

2,420,720. Method of preparing coated compositions. Alphonse Pechukas and Paul J. Gegner, assignors to Pittsburgh Plate Glass Company, Pittsburgh, Pa. Filed July 31, 1943. 9 claims. (Cl. 117-6). A method of providing a base with a synthetic resin surface.

2,420,738. Paper powder can. Harry K. Dickerman, assignor to F. N. Burt Company, Inc., Buffalo, N. Y. Filed Feb. 10, 1944. 1 claim. (Cl. 229-5.5).

2,420,773. Display box with adjustable bottom. Irving Dorfman, assignor to Federal Carton Corporation, New York, N. Y. Filed Nov. 28, 1944. 2 claims. (Cl. 206-44).

2,420,824. Fluid removal device for drying drums. Lloyd Hornbostel and John E. Goodwillie, assignors to Beloit Iron Works, Beloit, Wis. Filed April 1, 1944. 7 claims. (Cl. 34-125).

2,420,963. Closing flap for envelopes and the like. Edward J. Malo, Benton Harbor, Mich. Filed May 23, 1945. 1 claim. (Cl. 229-80).

May 27, 1947

R22,885. Leakproof container. Jack Press, Rahway, N. J. Original No. 2,301,580, dated Nov. 10, 1942. Application for re-issue Sept. 16, 1943. 3 claims. (Cl. 93-94).

2,421,141. Dispensing package. Trem Carr, Hollywood, Calif. Filed Oct. 6, 1943. 2 claims. (Cl. 229-17).

2,421,218. Noninflammable waterproofed textiles and method of making same. Frederick F. Pollak, Brooklyn, N. Y. Filed Feb. 11, 1943. 6 claims. (Cl. 117-76). The fabric is impregnated with a water-insoluble melamine salt of pyrophosphoric acid and coated with a melamine-formaldehyde condensation product.

2,421,225. Reusable nesting shipping container. William L. Stensgaard, assignor to W. L. Stensgaard and Associates, Inc., Chicago, Ill. Filed Oct. 6, 1943. 2 claims. (Cl. 229-23).

2,421,238. Reinforced collapsible paperboard container. John E. Borah, Penn Township, St. Joseph County, Ind. Filed Dec. 23, 1942. 2 claims. (Cl. 229-23).

2,421,272. Papermaking apparatus. Harry T. Knearem, Dallas, Texas. Filed Nov. 18, 1944. 3 claims. (Cl. 92-73). A means for driving calender rolls and controlling the tension of the sheet passing from the drying roll to the calender.

June 3, 1947

2,421,453. Collapsible fiberboard container. John Crawshaw, assignor of one half to Bjornulf Johnsen, New York, N. Y. Filed Feb. 15, 1944. 1 claim. (Cl. 229-41)

2,421,590. Treatment of sulphite pulp and liquor. Johan Åström, assignor to Svenska Cellulosa Aktiebolaget, Stockholm, Sweden. Filed Nov. 24, 1943. 2 claims. (Cl. 92-11). A method of washing sulphite pulp in the digester with the waste liquor from the fermentation of sulphite waste liquor.

2,421,601. Seam for woven wire fabric. Donald C. Dilley and Robert R. McGregor, assignors to The Lindsay Wire Weaving Company, Cleveland, Ohio. Filed July 13, 1944. 1 claim. (Cl. 245-10).

2,421,627. Rubberlike substances and compounding material. Clifford G. La Crosse, Baltimore, Md. Filed Feb. 10, 1944. 5 claims. (Cl. 260-23). The product consists of a combination of tall oil and a polymerized cut of coal tar type solvent naphtha which contains polymers of styrene, methylstyrene, coumarone, and indene.

June 10, 1947

2,421,748. Merchandise carton. Raymond E. Fink, assignor to National Folding Box Company, Incorporated, New Haven, Conn. Filed May 30, 1944. 14 claims. (Cl. 229-6).

2,421,829. Fourdrinier papermaking machine. Everett W. Clem, assignor to Rice Barton Corporation, Worcester, Mass. Filed July 28, 1944. 5 claims. (Cl. 92-44). A method of arrangement of table rolls and wire rolls.

2,421,842. Process of producing tall oil drying oils. Frederick C. Martin, Guttenberg, N. J. Filed Dec. 1, 1944. 23 claims. (Cl. 260-97.5). Tall oil is esterified with at least one polyhydric alcohol in the presence of at least one siliceous catalyst.

2,421,885. Pulpstone. Wallace L. Howe and Lorenzo S. Washburn, assignors to Norton Company, Worcester, Mass. Filed Sept. 18, 1945. 6 claims. (Cl. 51-206). A method of constructing a pulpstone.

2,421,886. Pulpstone. Wallace L. Howe and Lorenzo S. Washburn, assignors to Norton Company, Worcester, Mass. Filed Sept. 19, 1945. 2 claims. (Cl. 51-206).

2,421,892. Seal-down composition shingle. Lester Kirschbraun, assignor to The Patent and Licensing Corporation, New York, N. Y. Filed June 8, 1945. 7 claims. (Cl. 108-7). A flexible shingle of the asphalt composition type.

2,422,152. Container having an inner slidable merchandise carrier. Clifford C. Vatter, assignor to The Bradley & Gilbert Company, Louisville, Ky. Filed Feb. 9, 1945. 1 claim. (Cl. 229-6).

June 17, 1947

2,422,188. Method of and apparatus for making tubes of paper and the like. Harry T. Epstein, Brookline, Mass. Filed July 26, 1945. 6 claims. (Cl. 93-82). Method for making a tube having a plural-layered wall of flat strips of paper curled transversely with straight longitudinal seams.

2,422,328. Glucosides as plasticizers for water-soluble animal and vegetable adhesives. Harland H. Young, assignor to Industrial Patents Corporation, Chicago, Ill. Filed July 16, 1942. 7 claims. (Cl. 106-126).

2,422,344. Manufacture of hydraulic ce-

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ment products. Gustave L. Easterberg and Roger A. MacArthur, assignors to The Philip Carey Manufacturing Company, Lakeland, Ohio. Filed Aug. 2, 1940. 4 claims. (Cl. 92-39). A water, fiber, and cement slurry of contrasting color is applied to a semisolid hydraulic cement-fiber material and the product is subjected to suction.

2,422,345. Manufacture of hydraulic cement products. Gustave L. Easterberg and Roger A. MacArthur, assignors to The Philip Carey Manufacturing Company, Lakeland, Ohio. Filed Aug. 2, 1940. 2 claims. (Cl. 92-39). A non-water-laid hydraulic cement-asbestos layer is placed between water-laid sheets of hydraulic cement having linear fibers therein which are oriented longitudinally of the surface of the sheets and the whole is compacted.

2,422,423. Treatment of paper. Hamline M. Kvalnes, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Nov. 18, 1944. 1 claim. (Cl. 117-65). A cardboard (thickness of at least 0.005 inch) is dipped into an aqueous solution of urea-formaldehyde (concentration of 10 to 50% by weight), dried, and then heated at 280 to 320° F. under a pressure of 200 to 1000 p.s.i., thus improving the dimensional stability.

2,422,438. Shipping box for chicks and the like. Ralph N. Richards, Marion, Ind. Filed June 12, 1943. 11 claims. (Cl. 119-19).

2,422,504. Recovery of lower aliphatic acids from dilute aqueous solutions. Oswald Spence, assignor to Masonite Corporation, Laurel, Miss. Filed Feb. 5, 1944. 4 claims. (Cl. 260-540). A method of isolating the lower fatty acids from the reaction liquor of the Masonite process.

2,422,522. Method for the production of pulp from cellulosic material. James B. Beveridge and Richard D. Kehoe, assignors to Paper and Industrial Appliances, Inc., New York, N. Y. Filed April 24, 1943. 4 claims. (Cl. 92-6). A modification is proposed of the Asplund process.

2,422,605. Dispensing package. William J. Wells, assignor to F. N. Burt Company, Inc., Buffalo, N. Y. Filed Dec. 28, 1943. 5 claims. (Cl. 229-7).

JUNE 24, 1947

2,422,757. Hydraulic barker. Frank H. Swift, Portland, Oreg. Filed Jan. 17, 1944. 2 claims. (Cl. 144-208).

2,422,899. Package. Stig B. Hogdal, Danderyd, Sweden. Filed March 26, 1945. 2 claims. (Cl. 229-14).

2,422,998. Method of making laminated corrugated articles. Douglas D. Adams and Karl Rollius, assignors to Old King Cole, Incorporated, Canton, Ohio. Filed July 31, 1945. 2 claims. (Cl. 154-110). A method of forming laminates from flat plies of corrugated paper.

2,423,020. Process for treatment of lumber and other forest products. Joye C. Haun, assignor to Electric Steel Foundry, Portland, Oreg. Filed April 7, 1944. 13 claims. (Cl. 260-110). Pitch is removed from wood by aqueous acetone and the pitch is removed from the acetone solution by adding carbon tetrachloride.

2,423,022. Froth flotation of silica from iron ore by anionic collectors. Earl C. Herkenhoff, assignor to American Cyanamid Company, New York, N. Y. Filed April 10, 1944. 7 claims. (Cl. 209-166). One of the proposed reagents is tall oil.

2,423,027. Express receipt holder. Alfred J. Hopkins, assignor to Gaw-O'Hara Envelope Company, Chicago, Ill. Filed July 26, 1945. 2 claims. (Cl. 229-72).

2,423,047. Tractor operated log and tree saw. August F. Pfingsten, Rock Rapids, Iowa. Filed June 18, 1945. 1 claim. (Cl. 143-19).

2,423,053. Laminated paper product. Raymond A. Steffen, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed Aug. 2, 1944. 5 claims. (Cl. 154-50). The laminate contains at least one fibrous paper layer and a layer of moisture-proofing material containing a modicum of free oil material; the two are separated by a layer of paper coating composition consisting of adhesive and mineral filler which is more oil absorbent than the paper layer.

OBITUARY

McKenna and Newell Die in Skid Crash

HOLYOKE, Mass. — George M. McKenna, associated for many years with the White & Wyckoff Manufacturing Company, and prominent in State and National Guard activities, and Alfred J. Newell, another White & Wyckoff official, were killed July 10 in an automobile crash in Brimfield, when their car skidded into a bus on the rain-soaked Boston Post Road.

McKenna was manager of the greeting card department of White & Wyckoff. Newel was assistant manager of the stationery department of that firm, and was en route home from a business trip in Providence, R. I., at the time of the fatal crash.

State police said that McKenna lost control of the car on the slippery pavement while traveling at high speed. A doctor aboard the bus, who examined the bodies, said they died instantly.

McKenna had been associated with White & Wyckoff for 27 years, starting as an office boy in the main office. He had been assistant manager of the greeting card division until his promotion to manager of it seven years ago. His wife and three children survive.

Newell worked at the company before entering Ohio University, and returned there following his graduation in 1933. He leaves his wife and two children.

Charles A. Esty

BOSTON—Charles A. Esty, 64, president of Carter, Rice & Company, Corporation, Boston and Worcester, died July 9 at his residence, 20 Vernon Street, Framingham, Mass. Mr. Esty was born in Framingham, the son of Frederick M. and Georgia Harrington Esty. After graduation from Yale in 1904 he worked in Cuba until 1906, when he returned to the United States, joining Stone & Andrews, Boston paper merchants. He served as vice-president of that firm for two years before organizing the Charles A. Esty Paper Co. of Worcester, Mass., in 1915.

He remained as president until 1928 when the company was merged with Carter, Rice & Company, Corporation, of which he became managing director. He was named president in 1933.

He was a past president of the New England Paper Merchants Association and a member of the present board of directors, past president of the Boston Paper Trade Association, president of the Framingham Historical Society, trustee of the Framingham Library, trustee of Edgell Grove Cemetery, member of the Yale Club of Boston, director of the Congregational Building Association, and deacon of the Plymouth Congregational Church, Framingham. He served with the State Guard in World War I and was a Mason.

Living are his wife, the former Margaret L. Cowles; two sons, Frederick C., and Charles C., both of Worcester; three daughters, Mrs. Margaret Seamans, Amherst, N. H.; Mrs. Priscilla Tweddle, Woonsocket, R. I., and Miss Julia Esty, Framingham, and a sister, Mrs. Grace E. Barrett, Holyoke, Mass.

Funeral services were held July 12 at the Plymouth Congregational Church, Framingham, with burial in Edgell Grove Cemetery.

Nathan D. Bill

SPRINGFIELD, Mass.—Nathan Dennison Bill, 93, founder of the United States Envelope Company, retired manufacturer and philanthropist, died July 11 at his home, 284 Maple Street, victim of a heart attack that he suffered in February at his winter residence at Palm Beach, Fla.

Mr. Bill was honored several years ago "for outstanding service to the city." Known as the "father" of the Springfield playground system, he gave two parks, five playgrounds and parts of two public golf courses to the city, and served for 39 years as a member of the Park Commission, of which he was chairman.

Educated at the Springfield public schools and Eastman's Business College, Poughkeepsie, N. Y., he taught school in Ledyard, Conn., for several years. Mr. Bill began his business career at the age of 17 when he left the teaching profession to become an itinerant seller of books published by the firm owned by his father, Gordon Bill 2d. At the age of 20 he became one of four partners of the Union Envelope Company in this city. Two years later he established the Springfield Envelope Company and then started and sold several similar firms, most of them involving envelope manufacture.

Frederick Charles Black

NEENAH, Wis. — Frederick Charles Black, 42, mill office superintendent of the Kimberly-Clark plant, and formerly associated with the Niagara Falls plant of the company, died recently. Burial was in Niagara Falls, Ont.

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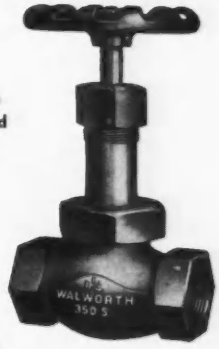

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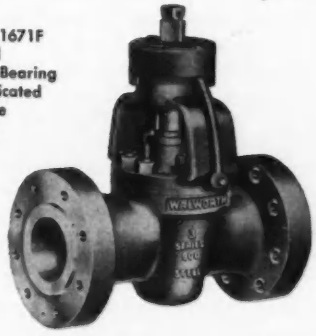

Pressure-
Seal
Steel
Valve

No. 726F
Iron Body
Wedge
Gate
Valve

DIGESTED

Trends in industry and trade are the result of many conflicting forces and tendencies, which work in opposite directions. The general average will move upward or downward, depending on which of the opposing forces is the stronger. In this tug of war at the present time, the two are about evenly balanced although the greater strength appears to be shifting slightly to the side of those which bring about contraction of business and of factory output.

Large consumer demand is one of the strongest and most widespread forces which has helped to sustain business activity and to keep volume high. People are still buying in large quantities not only in retail stores but also among all kinds of service industries. Sales have dropped in some lines, especially among luxury items such as furs, jewelry, liquors, and the higher priced goods in many other lines. Much of this reduction, however, simply represents a shift to the more moderately priced goods and to the purchase of the larger quantities of durable consumer goods which are coming on the market in ever-increasing quantities. Consumer expenditures are currently running close to 10 per cent higher than even the very high level of a year ago and within 5 per cent of the postwar peak.—*La Salle Extension University Bulletin.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
May 31	105.6	June 1	96.3
June 7	106.7	June 8	104.0
June 14	107.2	June 15	104.0
June 21	106.1	June 22	106.2
June 28 (Revised)	103.7	June 29	105.5
July 5	*60.3*	July 6	61.1

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan.	94.7	June	104.6	Dec.	97.0	Mar.	106.1
Feb.	98.4	July	94.0	Year Avg.	101.1	Apr.	105.1
Mar.	104.4	Aug.	104.7			May	106.2
Apr.	102.7	Sept.	101.3			June	106.0
May	100.7	Oct.	106.4	Jan.	102.1		
		Nov.	105.5	Feb.	105.9		

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.6	92.8	96.8	87.5	87.2	87.9	99.5	*104.2*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
May 31	98	June 1	85
June 7	98	June 8	96
June 14	103	June 15	98
June 21	102	June 22	97
June 28	102	June 29	98
July 5	*78*	July 6	70

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	*101*							

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Assocaition, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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EDITORIAL

Man to Man

For its frank approach to a development in industrial relations, for the benefit which it may derive from that frankness, and for the incidental good which it may have accomplished for others who may follow a similar pattern, the West Virignia Pulp and Paper Company has earned a generous share of the industry's spotlight. With the passage of the Labor-Management Relations Act of 1947 Westvaco has placed in the hands of every employe a digest of the significant features of the Taft-Hartley measure, along with a letter signed by the head man of the mill in which the employe is working. In its carefully planned summary of the law's features the message is honest and candid; in its presentation to the man on the payroll the message carries information, and hence opportunity for conviction, that may be lacking from the newspapers to which he has access. Its delivery with a personal message is a frank bid for continued confidence in the company's attitude, and a reassurance that Westvaco proposes to remain mindful of the man who runs the machines.

Addressed to "Dear Fellow Employees," the message goes on to say:

"Because of many heated arguments which have taken place in recent months, all of us probably have been a little confused about how this law will affect us. Many of you even may be worried about the future of your union and of our collective bargaining relationships.

"The law itself is a lengthy thing, couched in legal language. Recently I received a copy of a newspaper which printed the complete text of the law. It occupied two full pages of solid type. I read the law through carefully and I am frank to admit that there were many parts of it which I could not understand, particularly as it might affect us here.

"The law covers many points. Some may affect you directly and others will be of little importance or interest to you. The enclosed summary discusses the portions of the law which are most likely to affect you and our company.

"At this time I would like to repeat some of the basic philosophy of this company in its relations with our employees and the unions which represent them.

"1. Our company respects the right of its non-supervisory employees to organize and bargain collectively, not only because this is a right protected by law, but because it is a matter of democratic principle.

"2. It has been and still is the policy of our company to bargain in good faith with the elected representatives of our employees.

"3. It has been and still is the policy of our company to try to develop and maintain friendly and understanding relations with the union selected by our employees.

"4. Our company believes that the future of each of us depends upon respect for one another and upon mutual interest in the business from which we all earn our living. None of us can hope to benefit unless we all work together. You can have job security and high wages only if the company is prosperous."

Challenge to Freedom

For its alertness in turning, for a moment, from affairs of a purely industrial nature to give prominence to thoughts of an even more basic character, the Newsprint Association of Canada has performed a service to a wide field. An address by the Hon. L. B. Pearson, Canada's under-secretary of state for foreign affairs delivered on the occasion of his honorary investiture as a Doctor of Laws at the University of Rochester has been made available to those who find in the message a definition of present world problems, and a statement of their import, grouped with heartening reminder that the world, before this, has faced disheartening conditions.

"History, I know," said the Doctor, "should supply a useful corrective to the gloom and worry of our time. We may, I suppose, gain some comfort from the knowledge that man, faced with the sad memories and the grim consequences of his failures to live peaceably with other men, has often accepted as inevitable the prophecies of a doom that he has somehow managed to escape. Pessimistic speculation about the future, therefore, is always a risky intellectual pursuit. In the 18th Century, the British Empire was lost beyond salvation on the eve of its greatest hour of imperialist expansion. "I dare not marry; the future is so dark and unsettled"—said William Wilberforce in 1790. The confusion and turmoil, after Napoleon's new order had collapsed on the field of Waterloo as the old guard charged into the sunset and died, seemed to many to presage total domination of Europe by the Czar's muscovite hordes, whose presence aroused in the minds of Western Europeans emotions that have a familiar ring today. But a few years later the Cossacks had retired to the Don, and Europe was given the chance, which it did not take, to work out its own salvation through the co-operation of democratic national states. Some 30 years later, on his deathbed in the midst of that enviable if somewhat stuffy era of calm and contentment which we have called Victorian, the great Duke of Wellington sighed 'I Thank God that I am spared the ruin that is gathering around us.' In history, ruin and conquest are both relative terms.

"The fact is, that to every challenge given by the threat of evil and destruction, there has always been the response from free men. 'It shall not be.' "

W. L. Cook

EDITOR

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122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

New Applications for Boiler Feedwater Treatment Equipment*

By Daniel J. Saunders[1]

Abstract

A description is given of two installations which utilize zeolites for boiler feedwater treatment. In one plant, hydrogen zeolite treated water plus caustic is directly fed to a deaerating heater in a system. The system is fully automatic, including emergency features. In the other, hydrogen and sodium zeolite treated water suplement and combine with hot lime soda treated water for boiler feed.

Numerous methods of treatment are employed and various types of equipment are selected for conditioning water for boiler feed. The treatment and the equipment can vary for a given water supply, dependent upon such factors as boiler pressures, per cent of makeup; space available, permissible rate of depreciation on capital investments, initial and ultimate loads. Study of recent jobs resulted in bringing forth two installations which can be considered new and novel in the application of known equipment with proven performance records behind them. A description of each installation will be set forth in the following.

Plant Installations

PLANT A

In 1940 one plant installed an "ACD"** hot process softener unit, including vertical anthrafilt filters and an electro-chemical feed for lime and soda ash using an existing feeder to feed monosodium phosphate to the makeup deaerator storage compartment. For makeup and condensate, separate spray and deaerating heaters and vent condensers were provided. The system was designed to treat 24,000 g.p.h. makeup and 12,000 g.p.h. condensate. Boiler pressure was 400 psi. Boiler demands increased last year requiring an additional 6,000 g.p.h. makeup. It was considered unwise to place additional load on the makeup side of this system and uneconomical to install a duplicate hot process unit. Furthermore space was at a premium. Thought therefore was given to alternative arrangements. It was finally decided to take care of the immediate increase in boiler load demand and at the same time provide for another 6,000 g.p.h. increase by redesigning the condensate section of the hot process unit; add two more filters and feed hydrogen and sodium zeolite treated water to the condensate spray heater ahead of the returns as shown in Fig. 1. The zeolite units now being installed will satisfy the immediate increase. Note, however, the degasifier is good for 200 g.p.m. or 12,000 g.p.h. flow. Thus provision has also been made at this point to handle an additional 6,000 g.p.h. later, at which time duplicate hydrogen and sodium units only will be required. Regarding the 18,000 gallon storage shown in Fig. 1, this was existing storage provided by the purchaser, and provided 3 hours storage at the 6,000 g.p.h. rate or an hour and one half at the 12,000 g.p.h. rate.

It will be noted in Table I that the zeolite H and Na water is lower in total dissolved solids than the hot lime soda treated water. As a result the total dissolved solids in the final water will be lower with the combination treatment than had been the case with the hot process treatment. including phosphate.

Briefly there is considerable advantage to such an arrangement as that just described when a user operating hot process equipment is called upon to provide additional treated water for boiler feed not in too great an excess of the design capacity of the original hot process unit.

PLANT B

The equipment shown in Fig. 2 represents two hydrogen zeolite units capable of handling the user's boiler feed water requirements as given below for the first two steps. Actually three such units are being provided to meet the requirements, which now include the third step plus their needs for process water

The caustic feeders shown are designed for the ultimate load. The mixing chamber obviously is to accelerate mixing and neutralization of the low pH water produced by the hydrogen zeolite units. This correction is required to insure a suitable boiler feed water in this case and also to protect the process water lines.

Requirements for boiler feed—initial	35,000 lb./hr.
Requirements for boiler feed—next step	70,000 lb./hr.
Requirements for boiler feed—next step	140,000 lb./hr.
Requirements for boiler feed—ultimate	500,000 lb./hr.
Requirements for process—(fixed) 80 g.p.m.	(40,000 lb./hr.)
Makeup—initially and up to 140,000 lb./hr.	100%
Makeup—ultimate	50%
Boiler pressure	290 p.s.i.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

** "ACD"—A—Makeup; B—Condensate; C—Deaeration.

[1] Vice President, The Permutit Co., New York, N. Y.

The equipment consists of a duplicate set of caustic feeds so arranged that in normal operation the solution is fed automatically by proportionating pumps whose speed is electrically controlled by a General Electric Thy-mo-trol. If the electric power should fail for any reason the equipment is automatically switched to a water pressure solution feed. Upon resumption of electric service, the system is again switched automatically to pump operation.

The dissolving tank section of the pressure solution feeds is used to mix and store the caustic solution for the automatic pumps. Each pump is connected to one tank from which it pumps the caustic into a mixing chamber where it is thoroughly mixed with the zeolite H effluent. The amount of caustic pumped is controlled by a Leeds & Northrup recording pH controller. This in turn regulates the speed of the pumps by use of the Thy-mo-trol.

When the solution is exhausted from one tank a float switch automatically transfers the operation to the other tank and pump. When the second tank becomes exhausted a similar transfer takes place. Thus continuous proportionate feeding of caustic is assured. An emergency feature has been incorporated in this design should the electric power fail for any reason. In such event, a solenoid valve is de-energized opening diaphragm valves on these feeders. These feeders would then operate as displacement feeders during such an emergency. The primary orifice in the effluent line by means of the pressure differential created by it would proportionate dosages to the flow of the hydrogen zeolite treated water.

TABLE I.

Substance	Parts per Million (p.p.m.) as $CaCO_3$ Raw	HLS	PO_4	H_2Z-Na_2Z
Total hardness	382	13	3	1
Calcium	274	12	2	0.5
Magnesium	108	1	1	0.5
Sodium	10	103	114	80
Total cations	392	116	117	81
Bicarbonate, alkalinity	326	0	12	15
Carbonate, alkalinity	0	40	31	0
Hydroxide, alkalinity	0	10	0	0
Phosphate, alkalinity	...	...	8	0
Chloride	11	11	11	11
Sulphate	55	55	55	55
Total anions	392	116	117	81
* Compensated cations	0.96	...	...	...
	p.p.m.	p.p.m.	p.p.m.	p.p.m.
Carbon dioxide	41	0	...	...
Silica	7	3	3	7
Total solids	399	119	120	88

APPROXIMATE CHEMICAL COSTS

(Figures below are per million lb.; for costs per 1000 gal. divide by 120)

	p.p.m. as $CaCO_3$	p.p.m.	@ c/lb.	$ Per Million lb.
Lime	443	354	0.6	2.12
Soda ash	93	100	1.5	1.50
Monosodium phosphate	33	27	9.0	2.43
				$6.05
Sulphuric acid	...	535	1.0	5.35
Salt	...	227	0.5	1.14
				$6.49

* Cations are compensated for ratio of ThMA to total alkalinity.

When the electric power is restored, electric automatic operation by means of the pumps would be resumed through the aid of a time delay which automatically transfers the water pressure operation to the electric.

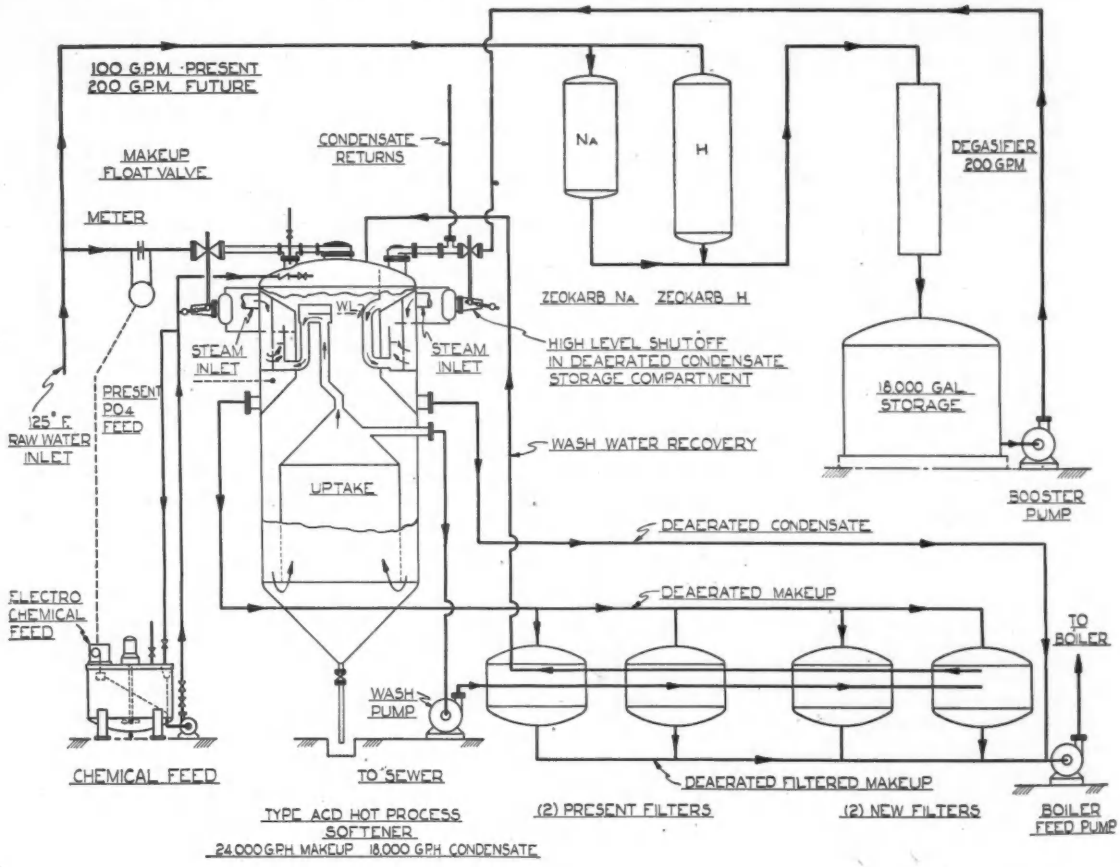

FIG. 1

Flow Diagram for Hydrogen Zeolite with Caustic Feeding Equipment

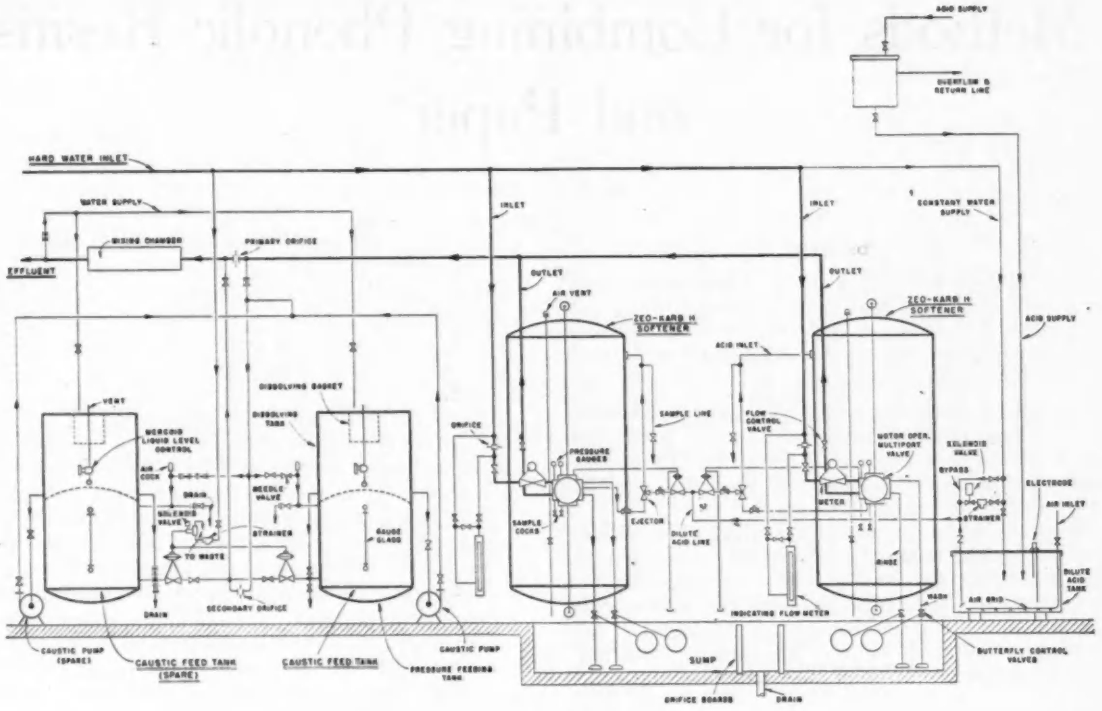

FIG. 2

The effluent of the system described is delivered directly to a deaerating heater (excluding the water taken off for process). Usually, hydrogen zeolite treated water, plus caustic or blended with sodium zeolite treated water, is delivered to a degasifier for CO_2 removal. The degasifier is generally located over a large storage tank or basin. In this case caustic soda is used to neutralize completely the CO_2 and at the same time produce a water having an alkalinity of 25 p.p.m. as shown in Table II. The 25 p.p.m. figure was decided upon to give 2.5:1 ratio of alkalinity of silica to avoid deposits as well as give a satisfactory pH.

What is different about this installation is that it is one of very few designed to date to feed hydrogen zeolite treated water direct to a deaerating heater but a more unique feature is the caustic feed arrangement shown and described. What should not be overlooked is the fact that all operations are fully automatic. In addition, the system is compact, flexible and lends itself to low initial investment with provision for additional hydrogen zeolite units as plant demands increase.

TABLE II.

Substance	Parts per Million (p.p.m.) as $CaCO_3$		
	Raw	H_2Z-NaOH	Deaerator
Total hardness	290	1	1
Calcium	212	0.5	0.5
Magnesium	78	0.5	0.5
Sodium	2	96	96
Total cations	292	97	97
Bicarbonate, alkalinity	220	25	24
Carbonate, alkalinity	0	0	1
Hydroxide, alkalinity	0	0	0
Phosphate, alkalinity	0	0	...
Chloride	30	30	30
Sulphate	42	42	42
Total anions	292	97	97
* Compensated cations	1.0	...	...
	p.p.m.	p.p.m.	p.p.m.
Carbon dioxide	7	201	0
Silica	10	10	10
Total solids	302	107	107
pH value	...	...	9.0

APPROXIMATE CHEMICAL COSTS

(Figures below are per million lb.; for costs per 1000 gal. divide by 120)

	p.p.m.	@ c/lb.	$ Per Million lb.
Sulphuric acid (93% H_2SO_4)	511	1.0	5.11
Sodium hydroxide	79	3.0	2.38
			$7.49

* Cations are compensated for ratio of ThMA to total alkalinity.

High Polymers VII

Interscience Publishers has just issued Volume VII in its series of text on the High Polymers. The latest monograph is entitled "Phenoplasts, Their Structure Properties and Chemical Technology," by T. S. Carswell of the Commercial Solvents Corporation (267 pp. 6 x 9).

Among the subjects covered are: Chemical Structure of Phenoplasts; Phenoplasts from Higher Aldehydes; Phenoplasts from Polyhydric Phenols; Physical Structure; Fillers for Phenoplast Molding Powders; Fillers and Resins for Phenoplast Laminates; Mechanical, Electrical and Thermal Properties; Oil-Soluble Phenoplasts; Technical Manufacture; Molding Technique; Miscellaneous Technical Applications.

The past five years have furnished much information in these fields and the record has not previously been collected in one volume. The book is not an elementary text and has been written for the student or research worker who may not be familiar with the technical processes employed in the production of phenoplasts.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $5.50 per copy.

Methods for Combining Phenolic Resins and Paper*

By E. S. Bauer[1]

Abstract

Off-machine, wet-web, and beater addition methods of combining paper and phenolic resins are briefly described. The three methods are then discussed in an effort to point out relative advantages and disadvantages of each method.

Phenol-formaldehyde resins are used in considerable volume combined with paper for the production of industrial and decorative laminates. These laminates find wide use in structural, electrical, mechanical, and decorative applications.

To date, the most common method of producing a homogeneous sheet of resin-bearing paper suitable for laminating purposes has been the saturation of the paper web with alcoholic solutions of the resins on standard treating equipment. Frequently, this method is referred to as, "off-machine treating" since it makes use of other than papermaking equipment.

Within recent years, two newer methods of combining paper and resin have created considerable interest. Both differ from the conventional system in that the resin and paper are combined on the paper machine. Known as the "wet-web" and "beater addition" methods, they are of interest to industry because, theoretically, either one should allow for the production of low cost, high volume, laminating grade papers.

Off-Machine Treating

All of the standard laminators use modifications and variations of the "off-machine" treating method. Paper in bulk rolls is fed into a treating machine, saturated with resin and thence passed through driers to remove the solvent and to "advance" or partially polymerize the resin. The treaters vary from simple dip tanks, with or without doctor blades, to roll coaters and squeeze equipment. Usually, the laminator will have several different types of equipment so that a wider range of papers and resins may be used. Drying units are of the horizontal or vertical type with circulating hot air, steam coil, or infra-red heating systems.

Having selected the best paper and resin for a particular application, the laminator adjusts his product as to resin content and flow. The first variable is adjusted by the solids content and viscosity of the resin varnish and variations in the treating head. Flow is usually controlled by the temperature in the driers and the speed of the machines.

After treating and drying, the paper is rewound and subsequently sheeted. The sheets are plied between cauls, placed in multiple platen, steam heated presses and cured at pressures varying between 200 p.s.i. and 2,000 p.s.i. with temperatures ranging from 300 to 360°F.

The chief advantage in using such a method is its versatility and the fact that a broad range of physical and electrical properties can be obtained. Practically any type of paper from rag and alpha to kraft can be used. In addition, practically the full range of available resins may be treated by this method.

Phenolic resins can be produced having a wide range of molecular weights. In general, resins with higher molecular weights will have higher viscosities at a given solids content. With higher molecular weight resins, saturation into the fibers themselves is minimized, reducing the tendency to embrittle these fibers. An embrittlement of the fibers usually results in low mechanical strength in the laminate—particularly impact strength.

Conversely, the lower molecular weight resins and hence lower viscosity varnishes, more thoroughly saturate the fibers thereby making them more impervious to subsequent penetration of water and moisture.

Since varnish type resins can be varied considerably between these limits, laminates can be produced which will combine the best features of both extremes. In addition, the resins can be modified with drying oils and plasticizers to improve electrical and fabricating properties.

Productionwise, the method is also versatile; short runs of special grades may be made without too much trouble as regards machine clean-up and losses. An additional advantage to the laminator is the fact that he can use the same equipment to treat asbestos, fabric, and glass which also find wide use as laminate fillers.

This versatility allows for the production of laminates suitable for the electrical industry which have low water absorption characteristics, good electrical insulating properties and high mechanical strength. They may be punched, sawed, or sheared. Mechanical and decorative laminates for use in refrigerators, table tops, and other industrial aplications may also be so produced.

The equipment and method is also satisfactory for the saturation of paper with other type resins such as melamine and urea. With these resins water-white, hard, decorative laminates are made. To date, these latter resins cannot be adapted to the other two methods under discussion.

The only relative disadvantage of the system is one of cost. It becomes important only where a large tonnage of a particular grade is needed. The paper is handled many times more than in either of the other two methods under discussion. Furthermore, resins suitable for off-machine treating are usually supplied as varnish solutions in organic solvents. These solvents are removed in the driers and are a complete loss unless expensive solvent recovering systems are installed. In addition to paying more for the resins because they are dissolved in expensive organic solvents, therefore, the laminator must con-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Monsanto Chemical Co., Springfield, Mass.

tend with the loss of these solvents in his treating equipment.

Wet-Web Saturation

Of the two paper machine methods for treating with resin, the wet-web process has proven the most practical. This method is frequently referred to as the "Novac process."

The paper is formed in the usual way on papermaking equipment and sometime after it has left the wire but before it is completely dried, the web is saturated with resin. The resin bath can be located just before the drier section or can be placed somewhere within the drier zone. Usually, the paper web is carried into the saturating bath by supporting wires or belts to prevent rupture of the web. The paper may contain anywhere from 10 to 70% water depending upon the particular technique used. The saturated web is squeezed to remove excess resin and then passed through driers in the conventional manner.

The amount of resin picked up by the web can be controlled, and is influenced, by the water content of the entering web, the viscosity and solids content of the resin solution, the speed of the machine, and the degree of after squeezing. Machines usually have to be slowed down, possibly as much as 30 to 50%, unless considerable drier capacity is available or unless it is possible to raise the temperature of the drying cans considerably above that which is common in papermaking practice; reduction in web thickness allows for faster machine speeds. The removal of water from the web is just about as rapid as for an unimpregnated sheet but the resin must also be advanced or polymerized to bring it to a suitable molding condition.

The system requires that the resins used be of the water dilutable variety. Normally, the resin used is a basic catalyzed liquid resin supplied at a solids content of between 70 and 75%. These resins are low in viscosity (under 300 cp.) and will usually tolerate dilution with water up to several times the resin volume.

If the resins are no longer dilutable with water, the water carried into the treater in the wet-web would precipitate these resins out of solution. This would impair saturation and, in this condition, the resin has a tendency to be sticky thus fouling up drier units. Resins which have high water dilutability are usually low in molecular weight. For this reason, they have excellent flow, good penetrating qualities and are relatively slower to "advance" or polymerize.

The principal advantage of the wet-web saturation method is one of economics. For long runs of a single grade of treated paper the full benefit of minimum handling is obtained. Machine speeds depend upon where in the system the web is impregnated, the resin and paper used, the web thickness, and drier capacity. Under the conditions which cover most present day requirements, little reduction in standard machine speeds is required. The thorough saturation of the web by this method insures high water resistance and also allows for molding under low pressures. Adding to economic features of this system is the fact that water-soluble resins are today the most economical from a price standpoint.

A primary disadvantage of this method concerns the physical properties of the laminates made from paper so treated. As mentioned previously, the process at present requires the use of low molecular weight, water soluble resins. These resins and the method used result in a thorough saturation of the individual fibers and the subsequent embrittlement of these fibers when the resin is cured. For this reason, laminates made from such paper exhibit low impact strength.

The expense involved in cleaning up and the importance of eliminating short machine runs necessitates the use of the method only where long runs of a standard grade are required. This is a serious limitation on the versatility of this system.

Since water-soluble resins must be used and since these materials cannot be varied over a very broad range, the physical properties of the laminate cannot be varied over wide ranges through the use of resin modifications. Paper so made cannot, at the present writing, be used for electrical insulating applications nor can they be used where ideal fabricating characteristics are required. Uses have been found for paper so treated which take advantage of the many savings to be derived from the use of this method. These uses do not require those characteristics unattainable by the wet-web process. To date, paper of this type has been used as plywood overlays, low pressure molding papers, surfacing sheets, and core stock for decorative laminates. In all of these applications, low cost, good flow, and high water resistance are the reasons for selecting wet-web saturated paper. The method is also suitable for the treatment of paper with resin, which is subsequently cured without pressure, to impart to the paper, resistance to acids, oils, water, and other chemical reagents.

Beater Addition

In the third method under discussion, the beater addition system, the resins are added to the pulp in the beater. The sheet is then formed in the usual way. For economic reasons and also to prevent waste water contamination, a closed, white water system is necessary. By properly selecting the pulp and resin type, the white water losses can be kept to a minimum; furthermore, with a closed circulating system, an equilibrium is eventually reached and losses become negligible. Resin retention usually varies between 75 and 95%. As with the wet-web system, the drying operation also serves to advance the resin and this step requires close control during manufacture.

The resins used are usually one-stage, basic catalyzed resins. Two-stage resins cannot be used since the hexamethylenetetramine would be leached out in the beater. The resins used are particularly designed to disperse well in the beater. As far as practical, they are taken to a point where they are completely water insoluble to minimize white water losses. Particle size distribution is controlled so as to insure uniform distribution throughout the paper web. The finer the particle size, the more uniform the distribution but the greater the mechanical losses through the wire.

The beater addition method has one advantage in common with the wet-web saturation process. For long runs of a single grade, the beater addition method has the advantage of low conversion cost. In some cases, the necessity for long runs may be considered a disadvantage since it limits the versatility of this method. Since the resins used have a somewhat high molecular weight and because of the mechanical method of combining, the resin is dispersed between the fibers rather than within them. Laminates made from such papers exhibit mechanical properties comparable with off-machine treated grades. Impact strengths are high for paper-base laminates.

TABLE I

	Off Machine Treating	Wet Web Saturation	Beater Addition
Conversion costs	Relatively high. Solvent losses. Double handling.	Low for long runs of single grade. Possible slowdown of machine. Minimum handling.	Comparatively low for long runs of single grade. Single handling. Some losses.
Resin costs	Higbest due to expensive solvents.	Lowest—carried in water.	Intermediate. Dehydrated, pulverized and compounded.
Grades available	All.	Limited to non-electrical and those requiring only fair impact. Suitable for decorative overlays (dark colors).	Limited to mechanical grades requiring large volume.
Typical applications	Usual laminating grades—electrical, mechanical, structural, and decorative. Electrical insulators; radio parts; refrigerator door panels; breaker strips; table tops (and counter).	Plywood overlays. Decorative cores.	Molding blanks pulp molding, but not fully developed for continuous webs.

The resins used are intermediate in cost between water-soluble resins and resin varnishes. The resins, however, cannot be varied over as broad a range as varnish type materials but do offer a wider variety of characteristics than do water-soluble resins.

Among the limitations of the process are the necessity for long runs of a single grade, as previously mentioned. In addition, the type resin used is at present confined to those one-stage resins which can be finely pulverized. At present, white water losses are somewhat high, making for resin losses.

In addition, the treated paper, as now made, requires molding pressures higher than off-machine or wet-web treated papers. This is primarily due to the fact that the resins used have somewhat inferior flow characteristics. Furthermore, the resin exists in the sheet as discrete particles rather than as a continuous film. In some cases, it is necessary to use pressures in the neighborhood of 2,000 p.s.i. in order that a homogeneous laminate is produced. This compares with between 250 and 1,000 p.s.i. for off-machine treating and 100 to 1,000 p.s.i. for wet-web saturated paper. This characteristic of beater addition paper can be improved somewhat by a rehumidification of the resin-paper combination. This, however, requires additional handling thereby canceling out some of the advantages of the process.

To date, very little paper made by this method has been used commercially. Essentially, the same technique is used, however, in the pulp molding process which has found acceptance in the industry.

Conclusions

It would appear that all three methods will continue to find use in the combining of phenolic resins and paper. Changes are being made in the mechanics of each method and continued research will undoubtedly bring forth new resins which will allow each system to expand. The two newer methods, particularly the wet-web saturation method, have opened up new applications for resin-bearing paper. Rather than displacing the off-machine treating method, it has increased the market potential for this type product. These new methods, because of their economic advantages, will undoubtedly find wide acceptance in the large scale applications such as the building trades. Off-machine treating will undoubtedly continue to be the most practical method of preparing high quality, special industrial and decorative laminates.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership.

Johannes Baars, Research Chemist, Van Gelder Zonen, Velsen, Holland. He attended the Technical College at Delft.

Nathaniel A. Billings, Jr., Salesman, Heller & Merz Dept., Calco Chemical Div., American Cyanamid Co., Boston, Massachusetts. He attended the University of Maine and the Babson Institute.

Emil W. Hockenjos, Technical General Manager, Societe pour la Fabrication de Pate de Bois a Bale, Switzerland.

DeLoss Kahl, Jr., Technical Representative, Merrimac Paper Co., Inc., New York City, a 1947 graduate of the Massachusetts Institute of Technology.

Donald Magill, Assistant Manager, American Can Co., New York City, a 1913 graduate of the University of Wisconsin.

George D. McTeague, Chemist, Smith Paper, Inc., Lee, Massachusetts, a 1941 graduate of the Lowell Textile Institute.

Willard H. Moon, Engineer, Superfine Paper Mill, Inc., Clayville, New York, a 1946 graduate of Northwestern University.

Frank E. Pendleton, Jr., Assistant Research Engineer, Fitchburg Paper Co., Fitchburg, Massachusetts, a 1943 graduate of the University of Maine.

Norbert F. Toussaint, Director of Chemical Research, Ditto, Inc., Chicago, Illinois, a 1940 graduate of the University of Notre Dame.

TAPPI Notes

E. F. Machell, formerly of Pacific Mills, Ltd., is now industrial engineer for The Foxboro Company, 154 E. Erie Street, Chicago 11, Ill.

John A. Hardy is now partner in the firm of George F. Hardy, 441 Lexington Ave., New York, N. Y.

Oscar A. Mockridge, Jr., of the Eagle-Picher Company, has been transferred from Joplin, Mo. to 420 Lexington Ave., New York, N. Y.

Marc Rollond is now manager of the Rolland Paper Co., Ltd., Mont Rolland, P. Q.

John Younger, formerly of the Stein Hall Company, is now chemist for the Munising Paper Company, Munising, Mich.

Moses H. Teaze has retired as a partner of Hardy S. Ferguson Company, New York, N. Y.

Harold M. Annis of the Oxford Paper Company was recently elected a director of the American Institute of Graphic Arts.

Variations and Similarities of Paperboard Mill White Waters*

By Willem Rudolfs[1] and Earl J. Axe[2]

Abstract

The paperboard industry utilizes the products of the other paper mills and because of the numerous raw materials used, the character of the board mill wastes can vary widely. A report is given of a study made on the wastes of eight paperboard mills.

Data are presented showing the volume and concentration of the wastes, their effect on B.O.D., and the efficiency of recovery equipment. It is noted that the removal of suspended material does not solve the pollution problem unless large volumes of dilution water are available.

In the process operation paperboard mills produce considerable quantities of waste waters which exert an effect upon the receiving streams. Under a grant from the National Council for Stream Improvement of the pulp and paper industries, a study was inaugurated to determine the basic factors involved in paperboard mill white water treatment.

Before fundamental studies could commence, it was necessary to make a survey of a number of mills to determine the characteristics of the mixed raw wastes and those coming from various machines, as well as the reductions in suspended solids and oxygen demanding materials accomplished by the treatment and recovery devices commonly in use.

For a proper appraisal of the pollutional characteristics of the wastes, a study was made of the total pollution contributed by the mills, as well as the various fractions of the wastes discharged.

Type of Waste

The paperboard mill is essentially a processing or converting plant which utilizes the various products of other mills of the paper industry. The raw material used by the board mill is, for the greater part, stock produced for another purpose, and having served that purpose, is reclaimed and reprocessed for yet a different purpose. The original processing and use of the stock leaves in the stock numerous and varied materials, both native and foreign to the paper fiber. These materials affect both the product and the wastes from the board mills.

The raw materials consumed by paperboard mills generally consist of varying quantities of chip, news, corrugated, cuttings, and mixed papers. Frequently coated and kraft stocks are used in some mills for liners. Considerable trash, food wastes or garbage, and rubbish of every conceivable kind, incident to the collection and bailing of mixed papers finds their way into the beaters influencing the strength of the wastes by their organic contact. The quality of material going to the beaters has been lower during and since the war, than previously, because of the scarcity of material and the popular conservation and collections. This factor, together with expanded production and indifferent sorting of mixed paper, has increased the quantity and pollutional strength of the wastes over the prewar years, in all the mills investigated.

The process of paperboard manufacture consists essentially of heating the raw stock into a suspension of pulp in water and thinning this suspension to about 3 to 5% (dry weight) in the machine chests with additional water for application to the felts or wires on which the board is formed. The quality and the type of board manufactured determine the quality or kind of stock in the chests. Most mills produce a number of grades and weights of boards and stocks are changed to meet specifications, by increasing or decreasing the relative quantities of chip, news, mixed papers, etc., going to the beaters. Results show that various types of stocks, incorporated into board have some influence upon the strength and character of the wastes from the individual mill as well as from the various mills, although no definite relationships between quantities or qualities of stock and resulting character of the wastes can be given since these factors also vary widely.

Sources of Waste

In a study of these wastes, an examination of the physical plants, their location, layout and operation, contributes to the understanding and explanation of the results of analyses of the wastes. Surveys were made of eight mills producing paperboard and of three mills producing tissue paper.

The construction and the physical layout of many of the mills do not lend themselves to advantageous segregation or control of the wastes, especially since much of needed expansion has been supplemented and extravagant of space. It is of some consequence that the arrangement for and the practice of good housekeeping in a particular mill, are reflected in the volume and character of the wastes from that mill.

Figure 1 shows diagrammatically the flow of water and wastes in a typical paperboard mill.

The beaters are usually supplied with wastes from the machines carrying from 0.02 to 0.5% fiber, for reincorporation in the stock, and augmented by reclaimed water from saveall equipment or by fresh water. Machine showers and stock chests are supplied with either fresh water or cleaner recovered water. Waste machine water, including shower water, if the latter is not segregated, in excess of that furnished to the beaters, may be discharged wholly or partly to recovery equipment or to the sewer. Some portion of the effluents of savealls settling basins or clarifier equipment, depending upon its quality may be reused directly in the beaters or on the machines or discharged to the sewer. In other mills, additional treatment in recovery equipment is practiced before reuse or discharge. Reclaimed fiber from recovery equipment along with coagulants is returned to the beater stock.

The divergence of physical plant layout and available recovery equipment determines to a varying degree the reuse of both water and fiber and consequently affects both the volume and strength of the wastes in different mills.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

Journal Series Paper of the N. J. Agr. Exp. Station, Dept. of Sanitation, Rutgers University, New Brunswick, N. J.

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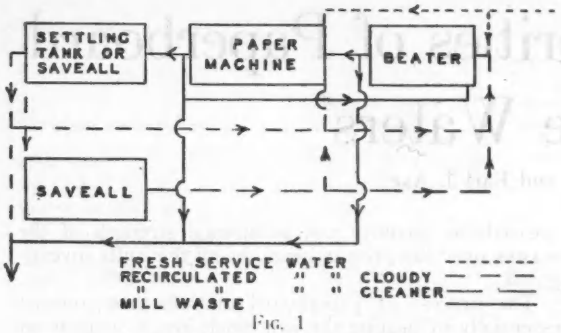

FIG. 1

Typical Flow Sheet for Board Mills

Volumes of Waste

The volumes of service water used by each of the various mills were largely estimated by either pumping or filter capacity or by production quantities rather than by instrumentation. Volumes of recirculated and waste water were likewise estimated. Since most of the mills surveyed were not equipped with water measuring devices, it was necessary to accept statements of quantities for the basis of computations.

The most consistently uniform characteristic of the wastes of paperboard mills, individually and collectively is the volume of waste produced. Hawley *(1)* reports wastes discharged from paperboard mills in Michigan varying from 30,000 to 50,000 gallons per ton of production.

Black and Klassen *(2)* report volumes of wastes at 6,000 gallons per ton of production from mills in Illinois. The volume of waste for the mills surveyed varied from 6,700 to 15,000 gallons with an average of about 10,000 gallons per ton of board, irrespective of the location of the mill, cost of pumping, quality of the raw water, or grade of board produced. Volumes of wastes from the individual mills surveyed are given in Table I.

Strength of Wastes

The strength and the character of the wastes are influenced by the original stock, the production and reclamation facilities of the mill for the recovery of fiber, and the recirculation of used water. The character of the wastes varies considerably in the cycle of operation, especially when the mill operates less than 7 days a week, with a clean-up period between cycles. The quality of the recirculated water deteriorates with the recirculation cycle because of increasing concentrations of finely divided and dissolved material, hence variation in strength can be expected during each cycle.

No accurate estimates could be made of the quantity of recirculated water or the number of cycles in any one mill. Although most mills operate fiber recovery equipment, excess quantities of clarified and dirty water overflow to the sewers. Occasionally, spills or dumps of beater and chest stocks may reach the sewers.

Mills operating multiple recovery units in series or at high efficiency show considerably lower suspended solids in the waste than mills which operate single or less efficient units.

The recirculation of reclaimed water serves to increase the concentrations of dissolved and finely divided material in the wastes until slime control becomes increasingly difficult. The control of slime tends to limit the reuse of reclaimed water and therefore affects the volume of both used water and waste, influencing the strength of the waste.

TABLE I.—VOLUMES OF WASTES FROM BOARD MILLS

Mill No.	1	2	3	4	5	6	7	8
Capacity, tons	65	105	65	375	300	100	125	70
M.G.D.	.63	1.00	.65	3.50	2.0	1.50	1.55	.72
Thousand gal./ton	9.7	9.5	10.0	9.5	6.7	15.0	12.4	10.3

TABLE II.—AVERAGE COMPOSITION OF PAPERBOARD MILL WASTES (DRY BASIS)

The Biochemical Oxygen Demand Figures are Expressed as 5 Day B.O.D. at 20° F.

	Mineral		Volatile		Total		B.O.D.	
Solids	p.p.m.	%	p.p.m.	%	p.p.m.	%	p.p.m.	%
Suspended	111	6.2	410	22.8	521	29.0	155	41.5
Settleable	101	5.7	375	20.8	477	26.5	79	21.3
Nonsettleable	10	0.5	35	2.0	45	2.5	76	20.2
Dissolved	754	42.0	522	29.0	1276	71.0	218	58.5
Total solids	865	48.2	932	51.8	1797	100.0	373	100.0

TABLE III.—CHEMICAL ANALYSES OF THE COMBINED WASTES

Mill No.	1	2	3	4	5	6	7	8
pH	6.8	6.5	6.7	5.2	6.5	6.6	6.3	7.0
Alkalinity, p.p.m.	80	60	65	362	84	220	88	200
Organic N, p.p.m.	12.0	8.0	10.0	16.0	0.32	21.4	21.2	2.0
Total nitrogen, p.p.m.	14.0	16.0	12.0	21.3	3.9	26.0	36.2	6.6
PO_4, p.p.m.	6.0	2.6	5.8	3.2	6.8	6.0	6.0	10.8
B.O.D., p.p.m.	245	228	230	981	212	580	220	289

TABLE IV.—SOLIDS AND B.O.D. OF INDIVIDUAL MILL WASTES

Mill No.	1	2	3	4	5	6	7	8	Ave.
Total solids, p.p.m.	944	1300	892	2244	1362	3428	2586	1617	1797
Ash, total solids, %	57.2	55.2	43.1	31.4	54.1	50.6	42.0	52.2	48.2
Suspended solids, p.p.m.	414	360	328	867	252	858	402	683	521
Ash, suspended solids, %	36.2	19.5	36.6	9.8	25.4	16.8	15.9	10.3	21.3
B.O.D., p.p.m.	245	228	230	981	212	580	220	289	373
Ratio: Dissolved solids / Total solids	0.56	0.72	0.63	0.61	0.82	0.75	0.84	0.58	0.71

TABLE V.—VARIATIONS IN B.O.D.'s IN WASTE FROM THE SAME MILL

Date	Suspended Solids p.p.m.	B.O.D. p.p.m.	Date	Suspended Solids p.p.m.	B.O.D. p.p.m.	Date	Hour	Suspended Solids p.p.m.	B.O.D. p.p.m.
Feb.	1184	1130	May	704	393	Feb. 28	0600	392	260
Mar.	660	853	July	596	245	Feb. 28	0700	256	225
Aug.	756	960	Aug.	750	228	Feb. 28	0800	246	241

TABLE VI.—POPULATION EQUIVALENTS OF WASTES

Mill No.	1	2	3	4	5	6	7	8	Ave.
B.O.D., p.p.m. 5 day 20° C.	245	228	230	981	212	580	220	289	494
Population equivalent B.O.D. basis	8000	11400	7500	171000	21200	40600	17100	10100	36000
Population equivalent per ton	120	109	115	450	71	406	136	144	239
Population equivalent S.S. basis	10900	15000	8900	126000	21000	54000	26000	20400	35300
Population equivalent per ton	167	143	137	336	70	540	208	290	235

TABLE VII.—EFFECT OF VARIOUS TYPES OF FIBER ON B.O.D. OF CLARIFIED WASTES

	Total Volatile Solids, p.p.m.	Suspended Volatile Solids, p.p.m.	Pounds B.O.D./lb. Mixture	Pounds B.O.D. per Pound Volatile Suspended Solids	Increase Due to Fiber, %
"A" Clarified waste	938	none	0.18	...	...
"B" Pure cellulose	3902	2964	0.32	0.14	79
"C" Kraft fiber	1756	818	0.22	0.04	32
"D" Groundwood	1746	808	0.21	0.03	16

TABLE VIII.—CONTENTS OF PAPERBOARD MACHINE WASTES

	Liner Vats		Filler Vats		Extraction (Press) Rolls		Shower Water	
	Suspended		Suspended		Suspended		Suspended	
Mill No.	Solids, p.p.m.	B.O.D. p.p.m.	Solids, p.p.m.	B.O.D. p.p.m.	Solids, p.p.m.	B.O.D. p.p.m.	Solids, p.p.m.	B.O.D. p.p.m.
1	448	157	581	471	566	395	198	330
2	370	207	558	284	680	342	435	241
3	226	228	756	377	436	270	676	315
4	418	985	512	1080	...	...	360	560
5	503	752	930	750	179	378	144	120
6	884	587	884	587	524	380	156	15
7	462	295	462	295	374	283	204	99
8	1140	507	1140	507	448	208	396	126
Av.	556	465	728	544	458	321	321	237

Composition of the Wastes

Table II gives the average amounts of suspended settleable and dissolved solids and 5 day B. O. D. in the wastes from the paperboard mills.

It will be noted that about half of the total solids consist of volatile substances and that some 71% of the total solids are in the dissolved state. Of interest is the fact, that only 9% of the suspended solids are present in a finely divided state which do not settle in 2 hours. Eldridge *(3, 4)* and Hawley*(1)* found that plain average settling removed an average of 44% (maximum 65%) suspended materials in paperboard mill wastes in Michigan mills, as compared with 93% found in the sewers.

The suspended materials average nearly ⅓ of the total solids and contribute 40% of the total B.O.D. It is of further interest that about 50% of the B.O.D. exerted by the suspended material is due to the small portion of finely divided substances. Of the non-settleable solids, which constitute only about 2.5% of the total solids, 80% is organic and highly dispersed and contributes 20% of the total B.O.D. exerted by the waste.

The solids in the liquid portion of the waste (71% of the total) are in an extremely finely divided state or in solution. These solids cannot be removed by ordinary filtration. About 40% of these solids are organic and decomposable and this portion contributes 60% of the total B.O.D. of the wastes.

The relation between the suspended solids and the B.O.D. of fresh domestic sewage is usually about 1:1, whereas, the average results from the mill waste show a ratio of 1:0.33, indicating that a considerable proportion of the suspended solids are not readily oxidized.

A comparison of the B. O. D. rate of a strong domestic sewage with that the average board mill waste shows that the paper waste oxidizes at a slightly higher rate during the first few days, but after 5 days closely approximates the rate for strong domestic sewage. Figure 2 shows graphically this comparison. The same relation appears to hold for both sewage and paper waste which has been clarified by settling or by filtration. It appears, therefore, that the soluble substances cause the high B. O. D. and not the suspended material. Hence, removal of the suspended material does not solve the pollution problem.

Chemical Analyses

The chemical analyses of the combined wastes of individual mills are given in Table III. The reaction of paperboard wastes is sufficiently near neutrality in most cases to obviate any need for neutralization. Both the alkalinity and the phosphate are frequently influenced by boiler blow downs. The phosphates are of interest in connection with the rate of decomposition and also influence the volumes of sludges produced. Organic and total nitrogen are comparable with weak to medium sewage and are readily available as nutrients for slime organisms. They also increase the rate of decomposition of the wastes.

Variations in the Wastes

The wastes from individual mills show considerable variations in total solids, suspended solids and B. O. D. and have been found to vary in the same mill at different times.

The composition of the overall wastes from individual mills are given in Table IV. The variations in solids content of wastes from various mills are generally in relation to the recovery equipment available.

Some relationship appears to exist between the ratios of dissolved solids to total solids and the ratios of fresh water to recirculated water. The higher ratios appear to indicate higher ratios of fresh water to recirculated water. This relationship could not be definitely established since no accurate measure of water quantities was obtained. Black and Klassen *(2)* express the opinion that, "The concentrations of solids and B. O. D. in paper mill wastes are a function of the per cent of reused water."

The B. O. D. values of the wastes from board mills vary with the mill and from time to time in the same mill. Examples of variations in B. O. D. and suspended solids of wastes from the same mill are given in Table V for different days and different hours of the same day. Operational irregularities and cycles probably account for a part of the variations.

Population equivalent values on both B. O. D. basis (at 0.167 pounds of oxygen per capita) and suspended solids basis (at 0.2 pounds suspended material per capita) are shown in Table VI.

The pollutional matter in the wastes varies from about 70 to 450 persons on the B. O. D. basis and from 70 to 540 persons on the solids basis per ton of product, with an average population on either basis of about 240 persons. The significance of these figures is apparent if it is considered that five of the eight mills produced a waste which was substantially the same, while one mill produces a waste of somewhat lower pollutional character. Assuming that the five mills produced a 'normal" pollution load, it is obvious that the two mills producing from four to five times the pollutional load per ton of product are out of line.

Eldridge *(4)* gives population equivalents of paper board mill wastes varying from 17,000 to 112,000 persons. Black and Klassen *(2)* give population equivalents of 40 persons per ton, or materially less than the lowest found by the authors.

The wastes examined by these investigators were similar to the wastes of the mills discussed in this paper with the exception that the effectiveness of operation and recovery of suspended material was greater in the Michigan and Illinois mills.

Although most of the 5 day B. O. D. is exerted by the soluble material in all cases, the rates of B. O. D. exerted vary. Biochemical oxygen demand rates determined over an extended period are of importance because they show the effect on the stream over a prolonged period. Figure 3 shows the rates of B. O. D. exerted by the solids in the average waste in pounds of B. O. D. per pound of solids. The wastes

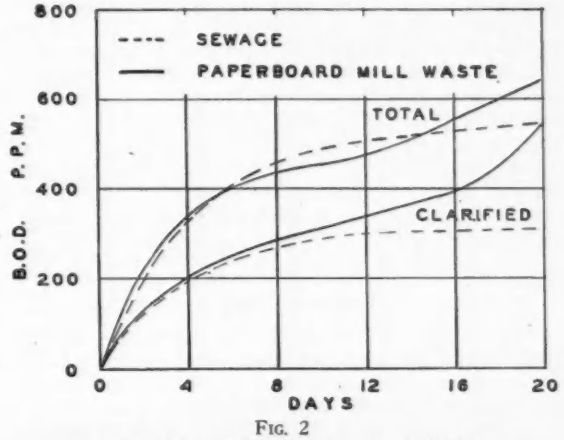

FIG. 2

Comparison of Rate of B.D.O. of Paperboard Mill Waste with Domestic Sewage

of the mills surveyed fall into three groups in respect to the solids exerting the highest rate of B. O. D. In group 1 (mills 1, 4, 8,) the dissolved solids exert the highest rate, in group 2 (mills 2, 6,) the suspended materials exert the highest rate and in group 3 (mills 5, 7,) the highest rate is exerted by the total solids. In an effort to explain the varying rates of B. O. D. exerted by the solids in the waste, a determination of the effects of various types of paper fiber on the B. O. D. rates is of interest.

A waste of average strength was clarified by coagulation with alum (2 pounds alum per 1000 gallons) and the supernatant filtered through an asbestos mat in a gooch crucible to remove all suspended material. The filtrate was clear, sparkling, but colored. Suspensions of pure cellulose fiber (filter accelerator No. 9-906 Fisher), groundwood fiber from clean unused newsprint, and kraft fiber from unused wrapping stock were made in the clarified filtrate. The rates of B. O. D. exerted by the clarified waste and of the paper fibers suspended in the clarified waste were then determined, using formula "C" mineralized dilution water and fresh sewage seeding. Each dilution bottle was shaken twice daily during the incubation period to return the settled fibers to the suspension and thus make them more accessible for biological oxidation.

The analyses of the suspensions are shown in Table VII. Figures 4 and 5 show the B. O. D. rates of the various paper fibers and of the clarified waste. The clarified waste containing all soluble material exerts the highest rate of B. O. D. pound for pound, followed by pure cellulose in the suspension, whereas the rate of oxidation of the kraft fiber and groundwood fiber were much lower. The increase in B. O. D. due to the pure cellulose fiber amounted to 79%, while the increases due to kraft and groundwood fibers were about 32 and 16%.

It appears that the cellulose fibers influence the decomposition of the board mill wastes most, because they are available for biological action. Groundwood, which retains most of the resins, gums, and lignins of the wood in a form not readily available for biological oxidation, has in consequence the lowest rate B. O. D. Kraft fiber has had most, but usually not all, noncellulose wood constituents removed by the original processing, and hence is somewhat more readily available than groundwood for biological oxidation and exerts a somewhat higher rate of B. O. D. in the wastes. The pure cellulose as used in the experiment represents the ultimate in fiber processing and the exclusion of all extraneous material, resulting in oxidation at the highest rate. All types of fiber make their influence felt on the rates of B. O. D. exerted by the solids in the wastes in proportion to the quantities and kinds present, however variable. The effects of the rates of decomposition of the fibers on the receiving waters indicate that the B. O. D. exerted by them is not all felt immediately or within the usual 5-day test period, but after the 6th or 8th day. Settling of the solids, forming sludge deposits, may modify the immediate load and contribute an accumulated pollutional load on decomposition and affect the recovery capacity of the stream.

Machine Wastes

The wastes from machine vats contribute most of the solids to the waste and individual vats may have 2 to 3 times the B.O.D. and contain three to four times the amounts of suspended material, as do the combined wastes from the mill. The press or extractor rolls contribute similar amounts of solids and

TABLE IX.—FIBER LOSSES IN BOARD MILLS

Mill No.	1	2	3	4	5	6			
Pounds per 1000 gals.	0.7	1.35	0.23	4.4	1.7	5.7	2.3	3.6	3.3
Per day	470	1350	146	15500	3400	8000	3610	2650	6500
Per ton	7.2	12.8	2.3	41	11	80	29	36	40
Per cent of daily capacity	0.36	0.64	0.13	2.1	0.5	4.0	1.4	1.9	1.34

TABLE X.—REDUCTIONS OF SUSPENDED SOLIDS AND B.O.D. BY RECOVERY EQUIPMENT

Mill No.	Type of Recovery Equipment	Number of Units	Suspended Solids, p.p.m. Infl.	Eff.	Reduction, %	B.O.D., p.p.m. Infl.	Eff.	Reduction, %
1	Coagulation settling	3	414	86	80	245	173	29
2	Settling	3	360	140	61	228	160	30
3	Coagulation settling	3	328	33	90	230	185	20
4	Vacuum filter	1	1080	480	52	1130	853	24
5	Vacuum filter	3	800	252	68	408	320	22
7	Vacuum filter	3	442	339	23	241	257	—6
8	Settling	2	784	452	42	442	351	20
	Average				60			20

TABLE XI.—REDUCTIONS OF 5-DAY B.O.D. BY COAGULATION WITH ALUM

Mill No.	1	2	3	4	5	6	7	8	Ave.
Mill waste B.O.D., p.p.m.	245	228	230	981	212	580	220	289	373
Clarified B.O.D., p.p.m.	147	147	180	586	172	260	138	153	223
Coagulant, lb. per 1000 gal.	2.0	2.0	1.5	6.0	0.6	4.0	2.0	0.5	2.3
Reduction, %	40	35	22	39	19	55	42	47	40

TABLE XII.—VOLUMES OF WASTES FROM SPECIALTY MILLS

Mills	A Tissue	B Tissue	C Tag
Capacity	68	500	80
Waste, m.g.d.	7.0	7.5	5.0
Gallons per ton product	103,000	15,000	62,500

TABLE XIII.—SOLIDS AND B.O.D. OF WASTES FROM SPECIALTY MILLS

Mill	A	B	C
Total solids, p.p.m.	820	447	2592
Ash, total solids, %	19.1	52	33.7
Suspended solids, p.p.m.	210	259	325
Ash, suspended solids, %	10.9	23	22
B.O.D., p.p.m.	86	124	166
Ratio—dissolved solids: total solids	0.76	0.42	0.90

TABLE XIV.—POPULATION EQUIVALENTS OF SPECIALTY MILL WASTES

Mill	A	B	C
B.O.D., p.p.m.	86	124	166
Population equivalents	30,100	45,000	41,500
Population equivalent/ton product	440	90	520

TABLE XV.—FIBER LOSSES IN SPECIALTY MILLS

Mill	A	B	C
Pounds per 1000 gal.	1.2	1.4	1.7
Pounds per day	8,400	10,200	8,400
Pounds per ton of product	123	25	105
Per cent of daily capacity	6.8	1.0	5.2

B.O.D. to the combined wastes. The water to the machine showers for most of the mills is cleaner reclaimed water or fresh water and consequently contributes lesser amounts of B.O.D. and suspended solids to the wastes than do the vats. Comparative values for the wastes from the machine vats, extractors, and showers of the various mills are shown in Table VIII.

The kind and quality of furnish supplied to machine vats and the quality of reclaimed water, together with the degree of control of leakage and spills from the vats, appear to determine the character and strength of the wastes from the machines and generally from the mill.

Fiber Losses

The apparent fiber content of the wastes average nearly 80% of the suspended solids. Losses of fiber from the various mills vary from about 0.25 to nearly 6 pounds per 1000 gallons with an average of about 3.5 pounds. Table IX shows the breakdown of fiber losses in pounds and per cent of daily

capacity, for the mills surveyed, which agrees with Hawleys *(1)* findings in board mill wastes in Michigan, whereas Eldridge *(4)* gives losses varying from 1.6 to 2.7 pounds.

Fiber losses occur from machine vats, from pits, in the discharges from savealls, and from spills and dumps. Losses of fiber resulting from inadequate maintenance or inefficient operation, although contributing to the pollutional value of the waste, is the concern of management and primarily a question of good housekeeping. There seems to be little excuse for fiber losses as high as 80 pounds per ton of product (4%).

The usual loss of fiber from savealls is due to the inability of the wire, usually 40- to 60-mesh, to effect the complete separation of the solids from the water. Fiber losses varying from 0.5 to 4.0% of the daily tonnage are reflected in the costs of operation to the extent of $60 to $75 per day for particular mills and should be sufficient incentive for more complete recovery.

Effect of Type of Recovery Equipment

Table X shows the relative effectiveness of several types of equipment for the removal of suspended material and B.O.D. from individual mill wastes.

The effectiveness of removal of fiber by vacuum filters is determined by several factors: (A) type of fiber, (B) size and length of fiber, (C) size of wire, (D) vacuum applied, and (E) cycles of recirculation. The size of the filter, particularly of the wire is selected to achieve a suitable degree of removal of suspended material in accord with economy of operation and filtering capacity. Hawley *(1)* gives the practical limit of mechanical recovery at between 1.0 and 1.25 pounds per 1000 gallons of waste in Michigan mills.

Vacuum savealls appear to effect a higher degree of removal of the long, strong fibered stocks such as kraft than of the shorter, weaker fibers of groundwood. Consequently mills using higher percentages of long fiber furnish, show less suspended materials and fiber in the wastes than mills using predominantly, news, mixed papers, and cuttings. Varying quantities of the types of stock affect the wastes in varying degrees of fiber recovery. Repeated returns of reclaimed fiber to the beaters are known to shorten the fiber. The short fibers constitute the major portion of the fiber that is discharged in the wastes from most mills. The opinion of the operators, that the shorter fibers tend to weaken the sheet discourages the effort to reclaim them.

Reductions of suspended solids by vacuum filtration varied from 20 to 70%, averaging about 50%. Settling only, effected similar reductions of suspended material in the mills surveyed, while chemical coagulation and settling accomplished removals of 80 to 90% of suspended materials. The reductions of B.O.D. by vacuum filters and plain settling were similar, varying from 5 to 30%, while chemical coagulation averaged 40% B.O.D. reduction.

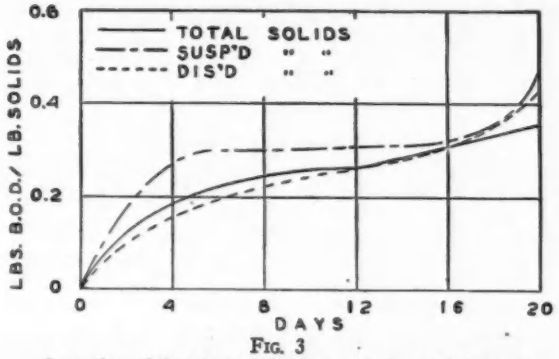

FIG. 3

Comparison of Paperboard Mill Waste with Domestic Sewage

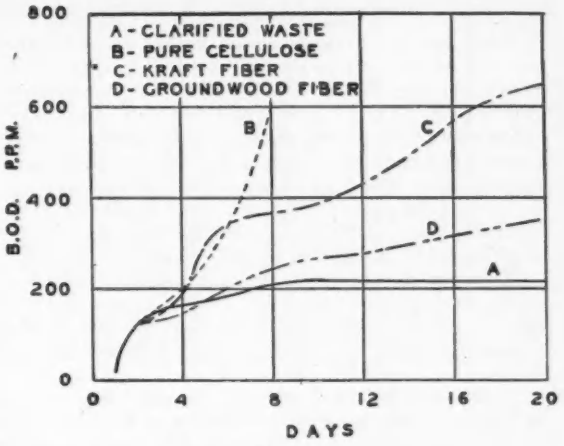

FIG. 4

B.O.D. Exerted by Various Paper Fibers in Paperboard Mill Waste

The coagulant demand of the wastes vary. Clarification studies, using alum doses of 0.5 to 6 pounds/1000 gallons, were conducted. To insure as complete removal of suspended material as possible, the quantity of coagulant used was comparatively high.

Results (Table XI) show that removals of more than 99% of suspended materials were accompanied by 20 to 55% of the B.O.D., with an average of about 40%. Chemical treatment of sewage results in B.O.D. removals as high as 70 to 75%. The coagulant demand of board mill wastes appears to be exerted by the soluble and finely divided materials in the wastes, since settled wastes require practically the same quantities of coagulant as unsettled wastes, but the latter settles more rapidly with 5 to 10% greater clarification in a 30 minute settling period.

Specialty Mill Wastes

Wastes from two tissue mills and from a mill producing board for tags, folders, etc., were examined for comparison with board mill wastes. The tissue mills produce sanitary specialty products from sulphite and groundwood pulps. The quality of the products requires a high order of plant housekeeping practice and a high degree of slime control in the vat and machine waters. The mill producing tag and envelope stock processes jute and bagging and operates recovery equipment only on the machine wastes. The volumes of wastes discharged by these mills are given in Table XII.

The volumes of wastes discharged by mills A and C per ton of product are six to ten times the volumes discharged by the average board mill. Mill B discharges little more than the average board mill. The wastes from mill C include cooking and bleach washes as well as machine water.

The solids in the wastes from these mills are similar to those from board mills (Table XIII) as well as the ratios of dissolved materials to total solids. The cooking and bleach washes in the wastes from mill C carry calcium salts in solution, the wastes containing from 200 to 1300 p.p.m. alkalinity as $CaCO_3$ and pH values varying from 8.0 to 12.0. The B.O.D. of the wastes are somewhat lower than those from the average board mill, so that the wastes discharged impose similar pollution loads upon receiving waters.

Southgate *(5)* records about 30,000 gallons waste per ton of raw materials processed in English mills producing specialties. The English wastes averaged 230 p.p.m., B.O.D. and reductions of suspended solids of 65% were obtained by plain settling for 11 hours. The cooking liquors and washings discharged amounted to 18,000 gallons per day with an average B.O.D. of 46 p.p.m. and contained 1% alkali. Mills A and B recirculate recovered water and use sweetener stock in the wastes to the recovery equipment.

The greater variations in the volumes of waste discharged by specialty mills in comparison with those discharged by board mills are also reflected in the greater variation of solids and B.O.D. of the individual mill wastes.

The pollutional load imposed on receiving waters by these wastes, however, is similar to that imposed by the average board mill. Table XIV shows population equivalents of the total wastes and per ton of product.

Population equivalents based on suspended solids are from 50 to 100% more than those given in Table XIV.

In mill A, both vacuum and flotation recovery equipment is used, resulting in 65% reductions of suspended material. Multiple vacuum recovery equipment is used in mill B and reductions of suspended solids of 80 to 96% are obtained. Reductions of B.O.D. of 60 to 70% are obtained in these mills. The reductions of suspended solids and B.O.D. in specialty mills are three to four times more than from similar equipment in board mills. The reason for greater reductions may be smaller quantities of finely divided and soluble oxidizable material in the wastes or greater efficiency of the recovery equipment. The use of new pulp stocks, sweetener stock, and slime control in the waters may account for greater reductions of B.O.D. by recovery equipment. Since removals of suspended materials by recovery equipment in specialty mills are 20 to 60% greater than in board mills, it would be expected that fiber losses would be in similar relation. This does not appear to be the case, although the fiber losses per 1000 gallons are 60% lower in the specialty mills, the losses per ton of product for mills A and C are about three times those of the average board mill, whereas mill B has somewhat smaller losses per ton of product.

Fiber losses in specialty mills in comparison with losses in board mills are given in Table XV.

Volumes of wastes at 4,000 gallons per ton carrying suspended material of 0.5 pounds per thousand gallons are given by Aries *(6)* for specialty mills of 35 tons capacity. Skinner *(7)* believes fiber losses from paper mills should not exceed 1% of production. Only one specialty mill and four board mills meet this specification.

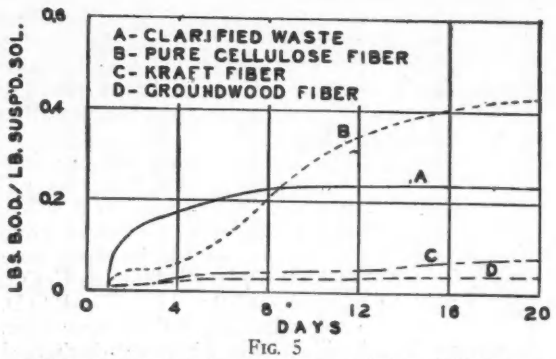

FIG. 5

B.O.D. Exerted by Various Fibers Present in Board Mill Waste

Summary

A survey of wastes produced in the reprocessing operation of eight paper board and three specialty mills shows that the volume and strength of the wastes produced vary considerably from mill to mill and from several units in the same mill. Quality and type of raw material, layouts of physical plants, daily production capacity, and facilities for recovery of fiber and water, the cycles of operation separately and collectively, influence the volume and character of the waste. Established procedure in individual mills, operating in regular cycles, discharges waste of rather definite characteristics peculiar to the individual mill.

The volume of waste and the composition of the waste per ton of product were found to be:

Average flow, gal.	10,000
Suspended solids, lb.	43.5
Settleable solids, lb.	39.7
Non-settleable solids, lb.	3.8
Dissolved solids, lb.	106.5
Total solids, lb.	150.0
B.O.D. (5-day), lb.	31.0
Population equivalents	240.0

The largest part of the suspended solids (91%) settle readily. The suspended solids exert about 40% of the total B.O.D., whereas the soluble solids exert about 60% of the total B.O.D. Although the nonsettleable material amounts to only 9%, about half of the B.O.D. of the total suspended material is caused by the small fraction of nonsettleable material.

The rate of oxidation of soluble material is greater than that of suspended solids.

Wastes from individual machines are similar to the wastes of the entire mill and vary in concentration of solids with the efficiency of operation.

Recovery equipment of the vacuum filter type is less effective than coagulation and settling for removal of suspended material. When sweetener stock is used, the effectiveness of recovery equipment is increased.

The average reduction of suspended material by recovery equipment is about 60% and removal of B.O.D. about 20%.

Wastes from specialty mills producing sanitary products are similar to wastes from board mills. The pollutional characteristics of these wastes are lower per unit volume than from board mills, but per ton of product they are higher because of greater volumes of wastes.

Fiber losses varied from 2.5 to 6.0 pounds per 1000 gallons or from 2.5 to 80.0 pounds per ton of product in board mills and from 25 to 125 pounds per ton of product in specialty mills.

Complete removal of suspended solids does not solve the pollution problem unless large volumes of dilution water are available.

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